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CODIFICATION OF NON-NATIVE ENGLISH: IS IT NECESSARY/POSSIBLE?

Jean D'souza

The unprecedented spread, in the last fifty years, of English as a word language has raised issues and concerns for which there are no easy answers. One of these issues is taken up in this paper - that of the status of non-native Englishes, the need to codify them, and the possibility of doing so. It is claimed that as English now belongs to the world, the `native-speaker' no longer has the sole prerogative to initiate changes and innovations in the language. Wherever English has put down roots it is marked by the ecology of the contexts in which it is being used. This, far from being a matter for concern, should be viewed as a source of enrichment and a mark of the vitality that has allowed English to become a world language.

1.0 INTRODUCTION

English began to spread around the world about four hundred years ago as a result of the exploring spirit of the British. In the last fifty years, however, this spread has excelerated in an unprecedented manner and today English is the sole official language of at least twenty-one nations. It is the co-official language of government, education, broadcasting, and publication in sixteen other nations and is the first language of some 300 million people around the world (figures taken from Bailey and Görlach 1982).

B.Kachru (1985:12) provides a useful way of looking at this unparalleled spread of English. He suggests that

> (1) The spread of English may be viewed in terms of three concentric circles representing the types of spread, the patterns of acquisition and the functional domains in which English is used across cultures and languages. I have tentatively labelled these: the inner circle the outer circle (or extended circle), and the expanding circle.

The `inner' circle refers to the use of English in native contexts, e.g. Australia, Canada, England, the United States, New Zealand. The `outer' circle comprises countries in which English has become institutionalized (largely a result of colonization), e.g. India, Nigeria, Singapore, South Africa, Zambia. The `expanding' circle includes regions where English has not become institutionalized but is

used as a performance variety, e.g. China, Egypt, Japan, Thailand.

In the outer and expanding circles, especially in the outer circle, English has begun to function in contexts that are traditionally non-native. In these contexts the native speaker plays no part in the interchange of English. It is inevitable, therefore, that the language is changing in order to cope with the demands made upon it by its adoptive speakers. Distinct varieties of English have sprung up all over the world reflecting the special characteristics of the contexts in which it is being used (see for example, Chishimba 1983 for African English, Kachru 1983 for Indian English, Lowenberg 1984 for Malaysian English). This is especially true of the institutionalized varieties of English which have slowly developed their own norms for English. These are not necessarily the norms of native English:

> (2) A case where we already have the development of a local norm is Singapore English, where the highest sociolect, varying phonologically and to some extent lexically and syntactically from British English, is slowly replacing British English as the only acceptable norm (Platt 1975, 1977). Richards (1978) in his contrast between an integrative foreign language model and an interactional model stresses the existence of an internal norm for varieties such as Singapore English and states that "a different cluster of attitudinal factors operates from those present in the integrative foreign language model leading in this case to the rejection of the foreign model and an affirmation of a local norm" (Platt and Weber 1979:116).

The 'unique cultural pluralism' (B.Kachru 1985:14) that the non-native varieties have brought to English has aroused the fear that universally accepted standards no longer exist for the language and therefore what happened to Latin in the past will happen to English in the future i.e. it will break up into mutually unintelligible languages. To guard against this, concerns have been roused regarding codification, standardization etc.. A major question that is being asked is - Should nativization of English be permitted, and if so, to what extent?

In this paper I address the issue of codification of the non-native varieties of English and ask whether codification is necessary, and if necessary, whether it is possible. I will restrict myself to English in the outer circle because it is here that the problems become most serious. In the expanding circle English is viewed as a foreign language and therefore an exonormative standard is acceptable. In the outer circle, however, English has been institutionalized and

an exonormative standard is no longer seen as acceptable. In order to illustrate my arguments I take my data mainly from Indian English because it is the variety I am most familiar with.

2.0 CODIFICATION

The most common meaning of codify is `to arrange (as a collection of laws) in a systematic form.' (Webster's New Deal Dictionary 1978). In the context of language, codification brings in the problem of norms. The questions to be asked are: What are the norms? Who controls them?

B.Kachru (1985) discerns four types of codification:-

1. authoritative
2. sociological/attitudinal
3. educational
4. psychological

Authoritative codification entails an agency that legislates the norm for a particular language, for example, the Académie Française for French and the Academia della Crusca for Italian. English has never tolerated such an agency even though some attempts have been made in that direction (see Baron 1982). For English the instruments of standardization and codification have been sociological, educational and psychological. For example, a particular accent or dialect is seen as more prestigious (R.P. or Received Pronunciation in Britain, GAE or General American English in the United States), social pressure is then exerted on those who do not use this particular accent/dialect forcing them to acquire it because it becomes associated with power. Dictionaries, the media, teaching materials and teacher attitudes all work together to disseminate the standard. Thus, a subtle psychological pressure is at work forcing an individual to accept the standard unless he/she wants to be marked as `different'. This may seem to be a simplification of the facts, but is indicative of the general means employed for codification in the inner circle. What about the outer circle?

2.1 Till recently, codification in the outer circle has been seen in terms of a preferred model. So far the following assumptions have been made:

a) the norm is British English or American English,
b) learners are to acquire native speaker competence,
c) any shortfall is taken as `error' or as evidence of `interlanguage'(Y.Kachru 1985.)

Of late, however, these assumptions have been questioned. The main reason for this is, as pointed out earlier, the peculiar status of English in the outer circle where the language is not used only for very limited purposes but has acquired both `range' and `depth' (Kachru 1984). Learning English does not mean that the learner wishes to become a imitation Englishman or American. In most cases the foreign

learner does not need English for western culture but in order to function within his/her own cultural context. Describing the use of English in countries like Africa and India B.Kachru (1975b:114) says

> (3) In these countries the English language is not taught as a vehicle to introduce British or American culture. In these countries, English is used to teach and maintain the indigenous patterns of life and culture, to provide a link in culturally and linguistically pluralistic societies, and to maintain a continuity and uniformity in educational, administrative and legal systems.

Under these circumstances, English has its uses extended to non-native contexts and innovation inevitably plays an important part. Innovation is one result of the nativization of English, which itself is a result of the `new ecology' in which a non-native variety of English functions (B.Kachru 1982). In order to appreciate such innovations the role of English in the sociolinguistic context of each English using country must be examined and understood. Innovations are employed to express socio-cultural phenomena which may be unknown to the native speaker who, therefore, is not qualified to judge their appropriateness or acceptibility.

There are significant differences between the native varieties of English. Usages common in American English may not be acceptable in British English and vice versa. These differences, though, have been accepted and British English and American English are looked upon as national varieties of a common language. Why is it that the varieties that have arisen in the outer circle have aroused horror and the fear that the English language is disintegrating? Probably because the belief is that the native speaker has the right to use his language innovatively but the non-native speaker must be confined to a linguistic strait-jacket for fear that he do the language irreparable harm. As one writer has confessed:

> (4) It had always been my belief that the native speaker was the only one who could set the norms for the language and it was up to all second language learners to follow them (Moag amd Moag 1979:75).

What have not been taken into consideration are the non-native speakers' communicative needs and their notions of communicative competence. Often such speakers' discourse strategies, for example, represent their `attempts at expressing meanings that are crucial for their cultural identities' (Y.Kachru 1985). Inevitably, these identities

are different from those traditionally expressed by English and so English is changed and expanded to enable it to fulfil new needs.

The point to be drawn from the above discussion is that native English can no longer be seen as the sole norm-setter. English serves unique needs in the countries in which it is used and each country must decide for itself what it is going to accept as the norm.

> (5) English must exist in many different forms if it is to serve as a viable means of communicating the thoughts and ideals of very different cultures' (Moag and Moag 1979:75).

Given that we accept the possibility that an institutionalized variety of English i.e. Indian English, Nigerian English, Singaporean English be accepted as the norm then a different kind of codification is brought into focus. This codification implies determining the bounds of innovation or the "allowable" deviation from the native norms.

3.0 WHAT CAN BE CODIFIED?

At the outset I would like to make a broad distinction between:

a) the language used for everyday communication
b) the language used for self-expression/creative communication.

I maintain that codification has relevance for the former, NOT for the latter. The creative artist has always been a law unto himself, e.g. E.E.Cummings, James Joyce, Gerald Manley Hopkins, to name but a few native English writers who have used language in a singular way. I see no reason to deny the non-native English writer the license enjoyed by his native counterpart. One cannot lay down boundaries for the creative artist. He may wander where he will and the merits or demerits of his writing must be judged by the standards of literature, not the rules of grammar. Turning then to the language of everyday communication the question to be asked is - Do we need to codify it? Why not adopt the `anything goes' attitude?

English is the world's most widely used language and it has a heavy `vehicular load' (Quirk et.al. 1972). It is used for a variety of purposes not only intranationally but also internationally. It is the language of international business, science, politics, aviation etc. The advantage of codification is that it allows for educational and social mobility, for intranational and international intelligibility. It allows the Yorkshireman to communicate, not only with his own countrymen, but also, should the occasion arise, with the Indian from Tamilnadu.

Codification, however, also has its drawbacks. These are that codification gives rise to elitism, the deficit hypothesis (Bernstein 1966) and in the outer circle to a confusion between norm and behaviour, if a native model is accepted as the norm. Does this mean that codification should be eschewed altogether? The answer is `no'.

3.1 Quirk et. al. (1972) refer to the `common core' of English (Quirk 1985 calls it the `hieratic lexicon and grammar'). It is here that I believe that codification is both necessary and possible. The common core of English (basic grammar and vocabulary and the essential phonemic distinctions) must remain intact if English is to remain English. Core grammar, core phonemic distinctions, therefore, must be taught and insisted upon. This goes without saying, however, because so far the standard varieties of all kinds of English (native and non-native) have not deviated too much from the common core.

We have to distinguish between informal, familiar language and serious exposition; between educated and uneducated uses of language. Informal and uneducated speech deviate the most from the norm while serious exposition and educated speech keep to the norm very closely. In addition, variation between varieties is greatest at the level of phonology, less at the grammatical level. The educated varieties of both native and non-native English move away from dialectal usage to a form of English that cuts across dialect boundaries and in the case of world Englishes, across major varietal differences. Thus educated Indian English is probably more intelligible to an educated speaker of British English than Yorkshire English would be (it is significant that a recent television series The Story of English used subtitles in standard English for dialect English speech). In the next section I will take up some examples of Indian English to illustrate my arguments.

4.0 INDIAN ENGLISH

The existence of Indian English as a distinct variety of English had been a hotly debated issue for some time. Thanks to the pioneering efforts of B.Kachru (see Kachru 1965, 1975a, 1976 etc.) the term has met with a degree of acceptance in recent years. Indian English (IE) differs from British English (BE), the variety it was modeled on, in the following ways (except where otherwise indicated, data has been taken from Kachru 1986, Nihalani et.al.1979 and personal observation):

(6) Grammar and Syntax:

IE `aircraft' (sg)	`aircrafts' (pl)
BE `aircraft' (sg)	`aircraft' (pl)
IE `I am having two houses'	
BE `I have two houses'	

IE `Where you are going?'
BE `Where are you going?

Lexis:
IE `hot water bag'
BE `hot water bottle'
IE `match box'
BE `box of matches'

Idiom:
IE `have a soft corner for someone'
BE `have a soft spot for someone'

Style:
IE mixes registers in a way BE does not e.g.
`He was felicitated on bagging the first prize.'

Socio-cultural:
IE is used to refer to phenomena unique to the Indian way of life e.g.
`He's threatening to have them shoe-beaten.
`She is my cousin sister'
`Are you wearing your sacred thread?'

Collocational:
IE collocates items BE would not e.g.
`They were awarded bribes.'
`Throw out the dining leaves'

Semantics:
IE `busybody' = a busy person
BE `busybody' = a meddlesome person

Loan words:
IE has borrowed a number of words from the various Indian languages e.g.
`hartal' `bandh' `lathi' `lakh'

Neologisms:
IE has a number of neologisms e.g.
`prepone' `freeship' `batch mate' `head bath'.

Pronunciation:
Some of the pronunciation differences between the two varieties are:
IE has 12 pure vowels and 6 diphthongs.
BE has 12 pure vowels and 8 diphthongs.
IE has ʈ, ɖ and t^{h}, d^{h}.
BE has t, d and θ, ð.

4.1 From the above list it may be seen that many of the processes used in Indian English are found in native English too. For example:

- BE has borrowed extensively from the Indian languages e.g.

(7) `calico', `chintz', `gingham', `curry', `toddy', `veranda', `loot', `baooo', `mahout' (Yule and Burnell 1903).

- All native varieties of English make use of culturally bound idioms (Data from Quirk et.al. 1972):

(8) British `that's not cricket' (that's unfair).
American `get to first base' (achieve success)
Australian `fossicking something out' (searching for something)

- IE makes use of archaic forms like `thrice' and `native place'. American English uses archaic forms too e.g. `fall' for BE `autumn'.

- IE has localisms like `study holidays'.
American English has localisms like `finger foods'

Turning to grammar and syntax `errors' in IE, the following point is of interest. In 1938 Kindersley noted that Indians omit the reflexive pronoun when using the reflexive verb `to enjoy' e.g.

(9) IE `Come and enjoy'
BE `Come and enjoy yourself'

Even in 1986 Indian school children are being corrected for using `enjoy' without the reflexive pronoun. In American English however, the verb `enjoy' is used without the reflexive pronoun even by educated speakers.

The compilers of Indian and British English A Handbook of Usage and Pronunciation in an afterward acknowledge the fact that some of the usages they have labelled Indian are also found in native English e.g. `native place' `forenoon'.

What are the implications of all this for codification? Should an exonormative model be insisted upon in the outer circle? Are variations to be sanctioned only after the native speaker has come up with them himself? Is there a `right' kind of variation and a `wrong' kind depending solely on whether the innovator is native or non-native? Does the native speaker have a monopoly on creativity? I maintain that the answer to each of these questions is `No'. English now belongs to the world and the native speaker is no longer the sole judge and arbitrator of its fate. Each `speech fellowship' (Kachru 1984) must be allowed to set the standards for the variety of English it uses i.e. each speech fellowship must itself codify the variety of language in use

in the fellowship. Educated usage and the degree of spread of the usage within the community will provide the basis for codification.

5.0 CONCLUSION

The focus on `usage' as the arbiter of correct English started in the late seventeenth century. The Oxford English Dictionary first referred to the term as a linguistic criterion in 1679. Today usage is widely accepted as a reliable judge. This standard should be extended to the non-native varieties of English. Innovations should be looked at in terms of usage and acceptability in a given speech community. `Bed tea' for example is widely used in Indian English even by educated speakers. It should not therefore be written off as a mistake or error. We need to realize that there is no `right' or `wrong' just `different'. The fear that this will lead to chaos is unjustified. Limits are set even within the non-native varieties. In Indian English for example, the form `I came by walk' is recognized as non-standard and would only rarely be used by an educated Indian in a formal context. Forms like `military hotel' and `self cooking' are regional and are not widely used or accepted. Non-native speakers are just as conscious as native speakers of the fact that `anything does not go'. The only difference is that the standards of judgement are dictated by local needs. A greater tolerance in linguistic matters is necessary and a better understanding of the socio-cultural contexts in which the non-native varieties function. One way of achieving this is to offer courses in the non-native literatures to native speakers at the college level so that a greater awareness is built up among the educated that language is not a monolith and that an Okara or a Rushdie has as much to offer as a Joyce or a Cummings.

In 1599 Samuel Daniel in a work entitled Musophilus, or a General Defence of Learning, said of English:

(10) And who, in time, knowes wither we may vent
The treasure of our tongue, to what strange shores
This gaine of our best glorie shall be sent
T'enrich unknowing nations with our stores?

The wheel has now come full circle and the `unknowing nations' have begun to enrich English with treasures of their own.

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ESP AND NON-NATIVE VARIETIES OF ENGLISH: TOWARD A SHIFT IN PARADIGM

Braj B. Kachru

This paper focusses on the non-native institutionalized varieties of English and their relevance to the methodology and materials on ESP. The presuppositions of current ESP texts and contexts are critically discussed from the perspective of the localized uses of non-native Englishes and their registers. An attempt is made to answer questions concerning issues such as: Acceptability, norms and functions of non-native varieties (e.g., Sri Lankan, Singaporean, Indian); pragmatic success and ESP; ESP and localized 'verbal repertoire'; the use of nativized features of English in the instructional materials. A number of suggestions are given for shifting the current paradigms of ELT/ESP. It is claimed that the present research on pragmatic success and failure of ESP has ignored important context-bound and code-bound variables of the institutionalized varieties. Some fresh data is provided to support the above claims. The paper also raises several linguistic, methodological and pedagogical issues.

INTRODUCTION

At the outset this paper warrants a cautionary note concerning the issues I propose to address. I shall essentially focus on those issues related to English for Specific Purposes (ESP; See Strevens 1977a) which concern us, for instance, as Sri Lankan, Indian, Nigerian, and Singaporean users of institutionalized non-native varieties of English. I shall, therefore, approach the concept of ESP from a perspective which to my knowledge has so far been ignored.

However, I shall begin with a digression concerning my understanding of the concept ESP? In ESP texts generally three basic assumptions are made: These relate to the appropriateness of language corpus: the formal organization of the corpus at various linguistic levels: phonetic, phonological (e.g., Flood and West 1952); lexical (e.g., Anthony 1976; Cowan 1974; Flood 1957); syntactic (e.g., Dubois 1982; Huddleston 1971; Lackstrom et al. 1972); and discoursal

(e.g., Widdowson 1971); and the relationship between the formal features and the functions of the texts in terms of the profession, participants, and so on. Thus we have courses on English for academic purposes, English for science and technology, English for business and economics, and English for vocational purposes, to give a few examples. The "specific purpose" of such materials, we are told, determines the type of texts, the organization of the features of the text and contextual appropriateness of the texts. The list of such text materials is overwhelming.[1] One can hardly quibble about the pedagogical usefulness of this concept. However, pedagogical acceptance does not mean that all the descriptive and methodological (and if I might add, functional) issues have been answered. These issues are being discussed and questioned in the fast-growing literature on ESP. Robinson (1980), for example, presents "the present position" of the field, and in a provoking paper Swales (1985) raises some basic ethnomethodological and attitudinal questions. However, the conceptual (I would like to avoid the term 'theoretical' here), and applied research on ESP seems to have avoided addressing issues vital for understanding the uses of English across cultures, Swales (1985) being an exception. And even in studies which present "common sense about ESP" (e.g., Brumfit 1977), the vital methodological and pragmatic issues concerning the non-native varieties of English and their relevance to ESP are left untouched.

ESP: SOME PRESUPPOSITIONS

In available literature on ESP, and in resultant pedagogical materials from the Western countries, two basic presuppositions are made. These concern the text and the uses and users of the text. These presuppositions, then, determine the conceptualization of the field of investigation and its methodology in several ways: The selected texts are typically those written by native speakers of English. In terms of the users of the texts, it is believed that the interlocutors are primarily of two types: native speaker-native speaker, and native-speaker-non-native-speaker. The typology of the ESP contexts is highly restricted. It includes, for example,

a. native interactional contexts,
b. native register-types,
c. native speech functions, and
d. native pragmatic settings.

Finally, in terms of the language use, there is a certain attitude about the varieties and subvarieties of English, specifically, about the non-native varieties, institutionalized or non-institutionalized. In this paper, I propose to bring the dimension of the institutionalized varieties to the deliberations on this topic.

NON-NATIVE VARIETIES AND ESP

What do I mean by the institutionalized non-native varieties of English? In several earlier studies [2] a distinction has been made between the institutionalized and performance varieties of English. This distinction becomes clearer if the diffusion of English is viewed in terms of three Concentric Circles: the inner circle, the outer (or extended) circle, and the expanding circle. The first circle represents the native varieties (e.g., American, British, New Zealand); the second circle represents the institutionalized varieties (e.g., Indian English, Nigerian English, Philippine English, Sri Lankan English), and the last circle represents the non-native performance varieties (e.g., Egyptian English, Japanese English).

By introducing the non-native Englishes into this discussion one is opening, as it were, a Pandora's box. A number of daunting questions must be answered before the non-native Englishes are recognized as areas of research for ESP, and before suggestions are made for appropriate texts for teaching. As an initial step, one has to answer questions such as the following.

First, the ontological question: What is the status of the institutionalized varieties and how acceptable are these varieties as 'standard' varieties of English? Second, the attitudinal question: Have the localized varieties been recognized in the language policies of non-native English-using countries? Third, a functional question: What is the role of such varieties as codes of communication? Fourth, a pedagogical question: What, if any, are current uses of such varieties in the instructional materials for the teaching of English? Fifth, a question concerning linguistic creativity: What do we mean by localized linguistic innovations, and what criteria may be used for determining whether such innovations should actually be incorporated in the pedagogical texts? The sixth question takes us to the contextualization of such innovations: What is the pragmatics of such innovations, and what are the functions of such innovations in various socio-cultural contexts? And, finally, an often asked vital question with wider attitudinal and linguistic implications: What will happen to English as an international language if divergent varieties are accepted, encouraged, and recognized as viable models for teaching? [3] I shall attempt to address theae questions in turn.

ACCEPTABILITY AND NON-NATIVE ENGLISHES

The term 'acceptability' is very elusive; it does not always entail a formal criterion for language 'acceptance' or ita 'use'. If used in a formal sense, the term conveys the

meaning of correctness according to certain standard, that of a dictionary, of a manual or of a prescriptive grammar. But, that is not the only use of this term. In its general use, it expresses a language attitude, and implies various types of appropriateness.

With respect to innovations in non-native Englishes, the attitudinal response often determines the 'acceptance' by the users of each variety in the Inner Circle. Without pondering on any formal or functional reasons for non-native innovations, the reaction often is "as a native speaker I would not use it (lexical item, construction and so on)."

This attitude even manifests itself toward some subvarieties of native Englishes, for example, toward Black English in the USA, or toward regional and some class-based varieties in Britain. (See, e.g., relevent sections in Ferguson and Heath 1981, Trudgill 1984).

How is acceptability determined? The following seem to play an important part in determining acceptability: One's own attitude toward a variety; the perception of others toward one's variety, and attitudinally-determined functional allocations of a variety, (for example, the reactions toward the use of basilect in Singapore, bazaar or Babu English in India, and Nigerian pidgin in Nigeria.) [4]

Now, returning to the non-native varieties, the issue of 'acceptance' seems to have been divorced from the pragmatic and functional contexts. That English has localized uses, and English has interactional uses with (mostly) other non-native speakers, these two important facts of language use are not well-recognized. In my view this non-recognition of pragmatic context has crated a serious gap between the researcher's concept of language use, and linguistic behavior, and the language needs of the users of institutionalized varieties of English.

NATIONAL LANGUAGE POLICIES AND NON-NATIVE ENGLISHES

The lack of pragmatism in methodology and the evangelical zeal of the specialists is not restricted to the 'outsiders' who are either indifferent to, or not familiar with, local situations (see Maley 1984). It is surprising that the national language policies and educational policies of the nations with institutionalized varieties of English have not, until recently, recognized the uses of English for intranational purposes. This pragmatic fact is not, therefore, reflected in language planning, teacher training, and curriculum design. The Anglophone nations (e.g., India, Kenya, Malaysia, Nigeria, Singapore, Sri Lanka) have, until

very recently, adhered attitudinally to an external norm of English English. The nations which were under the American influence (e.g., the Philippines, Japan) have generally followed the educated American model.

But, having said this, one must add an important caveat here. The language policies and the actual language performance show a serious conflict. The perceived normal rarely matches the language behavior. In Sri Lanka, where traditionally the standard of English teaching was very high - certainly before 1950 - this preference for an imitation model of English English was questioned (see, Passé 1947). During the post-independence period, this view has been well articulated by Fernando (1977) and Kandiah (1981). Dissanayake in his several papers (particularly in Dissanayake and Nichter (forthcoming)), focuses on this question from a literary perspective.

It is encouraging, however, that recently in the minds of some educators this conflict between an endonormative and exonormative model is being resolved, and the earlier 'linguistic insecurity' is now in less evidence (see Kachru, e.g., 1985:215-216). This shift toward the realization of actual language behavior is evident in the following ways: (a) the identification of a variety with regional modifiers such as Sri Lankan English, Indian English, Nigerian English, or Singaporean English without serious connotations of stigma: (b) the recognition of reasons for such identification in terms of national identity, educational realism, and localized functions of English; and (c) the recognition of English in the language policy of a given country such as Sri Lanka or India as a 'link' language for intranational purposes.

NON-NATIVE ENGLISHES AS CODES OF COMMUNICATION

A functionally and pragmatically important aside is appropriate here. Whatever external (or even internal) attitudes are present about the institutionalized varieties, and whatever descriptive labels are used for them, in reality the localized varieties of English are actually used by most of the users of English in these nations. The segment of population that uses external models comprises such a small percentage of the total population that for our discussion we might as well ignore it. If I might take an extreme case, the administrative network of the Indian subcontinent has been held together by the users of various types of Babu English (Widdowson 1979), and in Nigeria by Nigerian Pidgin. The code of the elite has generally been the localized educated variety.

In the functional network, the localized varieties of Indian English or African English have developed typically local registers, for instance, for agriculture, for the legal system, and for the localized speech functions. This

linguistic (and pragmatic) fact was recognized, for example, by Wilson over thirteen decades ago (Wilson 1855:i) concerning the use of what may be called ESP in agriculture in the Indian subcontinent. He observed

> Ryot and Ryotwar, for instance, suggests more precise and positive notions in connection with the subject of the land revenue in the South of India, than would be conveyed by cultivator, or peasant, or agriculturist, or by an agreement for rent or revenue with the individual members of the agriculture classes. [5]

Three decades later, suggesting an "Indian supplement to the English dictionary", Whitworth (1885:vii-viii) remarks:

> The words of Indian origin will be by far the most numerous, as it is usual, when new objects and ideas are met with to call them by the names they already possess. But this is not always done, and no one can make much acquaintance with India without hearing of alienated and unalienated land, permanent and annual settlements, inferior and superior holders, twice-born classes, right-hand and left-hand castes, village headmen and village accountants, governors and district officers; then references are frequently made to the solar race, the lunar race, the serpent race, even such words as 'month' and 'year' have different meanings in India and in England: and there are many names which, though their component parts are familiar English, yet express things, unknown in England such as 'bell music' , 'black buck', 'carpet snake', 'dancing girl', 'egg-plant', 'fire-temple', 'prayer-wheel', 'slave-king', 'sacred thread'...

Before I provide further examples of these registers and styles, let me go back to the question of localized 'verbal repertoire' in English, and the uses of such repertoire in the intranational contexts. The uses of English for intranational communication raises a host of complex issues which have generally been left unanswered in methodological literature on ESP. One can, for example, think of questions such as the following: (a) What is meant by communication, and the levels of communicability? (b) What determines pragmatic success and pragmatic failure of English in its international uses? (c) What role do the varieties within a variety play in local/national/regional communication? (d) What role does the context of situation play in communication, and what role should localized context-dependent innovations play in the pedagogical materials? (e) What accommodation does a native speaker of English have to make for participation in communication with those speech fellowships which use localized varieties of English? (f) What insights have we gained by research on intelligibility and comprehensibility concerning intranational and international uses of English?

And (g) What attitudinal and linguistic adjustments are desirable for effective teaching of localized varieties?

These questions may sound rather broad, but it seems to me that they are directly related to any serious discussion on ESP in the international context, particularly since they have been swept under the rug in the prolific literature that has been published on this topic during the last twenty years. Unfortunately, a large body of such publications is primarily motivated by commercial goals whose proponents have found it convenient not to encourage discussion of these more basic issues.

PRAGMATIC SUCCESS AND ESP

Now, turning to ESP: the underlying assumption for ESP is that, ideally, it contributes to maximum pragmatic success in the contexts of language use. It entails a hierarchy of encounter-types in which linguistic interaction has been observed and described. The research (see Smith [forthcoming], particularly the chapter by Candlin) on, what may be termed interactional aspects of language, has as yet been given very limited attention.

In such research there still is no awareness of the non-native contexts in which varieties of English have been used for, at least, a century in distinctly localized encounter-types. The competence of such users of English varies from local educated varieties to a form of pidgin. Such localized interactional contexts also show an extensive use of "mixing", and use of discourse types which presupposes bilingual or multilingual competence. [6]

The concepts situation, context, and attitudes are vital for understanding the issues and variables related to pragmatic failure or pragmatic success in the use of a variety of English as has been shown, e.g., in Chishimba 1983. In ESP-oriented research we find two problems: ethnocentricism in approach and neglect of intranational motivations for the uses of English. In functional terms, there is something wrong with such an approach. In the Outer Circle, the international roles of English are highly restricted: The domesticated (or localized) roles are more extensive. There is, of course, nothing wrong with high proficiency goals. But with such goals we unconsciously cultivate language attitudes which have psychological, social, and educational implications. And, in some cases, such goals take us away from linguistic and functional realism.

Pragmatic success, then, is determined by the context of encounter, and the participants in the encounter. We should, of course, expect maximal pragmatic success in "survival registers" or "survival ESP": e.g., seaspeak, aviation, diplomacy, and so on. In registers of law or medicine, we

must investigate the localized strategies of lexicalization, mixing, switching, and lectal change.

This pragmatism and shift in the paradigm is well-articulated in Swales (1985:223) who, like J. R. Firth, argues for "local knowledge" and "...for renewal of connection with the textual environment, and for greater attention to the tasks that specialized environments require of their occupants." And, he rightly feels, that "we have given text too great a place in nature and believed a thick description of a text is the thickest of description of them all." The question is: In doing so, and by ignoring the "conventions of conduct" and "localized pragmatic needs", are we actually producing, to use Clifford Geertz term, "thin descriptions" which have less pragmatic validity?

The phenomenal spread of English, the diverse users of the language in world cultures, and the development of world Englishes make it imperative to view concepts like "communicative competence," "pragmatic success," and "pragmatic failure" and ESP from a realistic perspective of current world uses of English. One has to consider several aspects in order to provide functional bases to such concepts. These aspects include, for example,

(1) Variety specific ESP: The formal characteristics of ESP can be distinguished in terms of their uses in the three Concentric Circles. The pragmatic success or failure in, for example, doctor/patient interaction, or teacher/student interaction is determined by the cultural background and linguistic repertoire of the participants. When we talk of legal English and the discoursal and other strategies associated with it, we seem to use an idealized notion of "legal English." In reality the situation is different. In South Asia, legal English has localized subvarieties which may be distinguished in terms of the hierarchy of courts and lawyers who practice in such courts, the supreme court, the high court, the lower courts, the district court, the moufusil court, and so on. At each level, a specific type of language is used with its characteristic lexicalization and other features. An idealized variety of legal English does not guarantee pragmatic success, nor does research on legal English of the USA or the UK provide useful insights for understanding legal Englishes of South Asia, Southeast Asia, or West Africa. [7]

Let us consider the South Asian situation: South Asia gives us a repertoire of legal Englishes, which have distinct characteristics in the following respects:

(a) the level of the court,
(b) the type of the legal document, and
(c) the participants in the legal interaction.

This concept does not apply only to legal English, but also to other ESP types (e.g. administration, banking, newspapers).

2. Typology of ESP: A typology for ESP should take into consideration parameters such as the following:

(1) What is the functional range of the ESP types with reference to intranational and international uses?

(2) Who are the participants in the situations?: (a) users of one variety and/or (b) users of several varieties?

(3) What is the language competence of the users on the cline of bilingualism?

(4) What are the distinctive characteristics of the verbal repertoire for the participation in the interaction?: (a) H(igh) varieties, (b) L(ow) varieties, (c) mixing of varieties, and (d) bi- or multidialectism or multilingualism?

(5) How are the codes used in the "interaction" viewed by those who are "outside" the speech fellowship, and by those who are "within" the speech fellowship?

(6) What formal features of the ESP must be learned by the members of the speech fellowships who are essentially "outsiders"?

(7) What are the implications of the formal innovations on the materials production and the curriculum? [8]

The repertoire of a specific ESP (e.g., legal English) clearly shows that the burden of pragmatic success and pragmatic failure does not rest only on the non-native learner; it rests on the native speakers of English, too. Particularly, those users who desire to establish successful communication with the users of other varieties, native or non-native.

If the international uses of English are viewed within this context, it has several consequences: theoretical, applied, methodological, and pedagogical. In theoretical terms, one has to reconsider the notion "speech community" for English, as I have stated elsewhere (Kachru, 1985). One has to view the world Englishes in terms of speech fellowships. The defining context and acceptance of linguistic innovations must be related to the pragmatic context of each speech fellowship. This is particularly important in the case of institutionalized varieties of English. The applied aspects include, for example, research on lexicography, discourse strategies, interactional sociolinguistics, and attitude studies.

The methodological aspect becomes important since one has to raise questions about the universal validity claimed for language teaching or language learning methods. The present tendency that the Western methods should be sold to the non-native users with an evangelical zeal is suspect (for a stimulating discussion, see Maley 1984 and Phillipson and

Skutnabb-Kangas 1986). It is particularly suspect since commercialism and ethnocentricism seem to determine such hard sell. What is more frustrating is that the survival rate of such "methods" does not seem to be more than a decade. It is sad that often these methods are promoted without much familiarity with intranational contexts in which the non-native varieties of English are actually used.

Finally, the pedagogical aspects. This takes us to the educational policies, teacher training programs, and language in the classroom, and language use out of the classroom. One can develop each category into a full paper. The above discussion is just to provide a bird's-eye view of the issues involved.

Let me now turn to two issues specifically related to one localized variety. First, the question of the use of nativized linguistic features in instructional materials, and second, the divergence of nativized varieties and the future of English as an international language. I shall discuss these in the two following sections.

LOCALIZED LINGUISTIC CHARACTERISTICS AND INSTRUCTIONAL RESOURCES

I will interpret the term "instructional resources" in a broader sense: both for pedagogical materials and other supplementary published resources to which a student may be exposed. At the lexical and collocational levels, let us consider the localized characteristics of ESP in the caste system in intercommunal (Muslim vs. Hindu) interactions and in politics. Consider the following lexical sets.

LEXIS RELATED TO CASTE: The lexical item "caste" may be followed by -basis, -brotherhood, -dinner, -distinction, -domination, -elders, -feast, -feeling, -following, -less, -mark, -proud, -sanctity, -union, -vermin, -waif, -well. The lexical item "caste" may be preceded by high-, inter-, low-, lowest-, out-, professional-, sub-, upper-.

Note also the following modes of address and reference used in the context of caste: highborn, high caste, twice-born, upper caste, casteless, low-caste, lower caste, untouchable.

LEXIS RELATED TO LOCAL RITUALS: rice-eating ceremony, turmeric ceremony, naming ceremony, aroti time, bath milk, car festival, shagan ceremony, brother-anointing ceremony, rain-bringing ritual, vinayaka-festival.

The localized innovations at other levels have been illustrated in several studies. I will not elaborate on this point here due to the limitations of space. However, the localized innovations must be distinguished with reference to

the cline of bilingualism and the sociocultural contexts of use as has been done, for instance, in the case of Singapore, Malaysia, India, and English-using parts of Africa.

In the case of Sri Lankan English, the need for such distinctions has been well illustrated in Kandiah (1981). Consider, for example, the illustrations given by him: sil (a Buddhist religious observance); asweddumize (a process used by farmers in paddy fields); basket woman (a woman whose behavior is rouch); rice puller (an appetizer eaten with rice). The items junction, under, is too much, put a telephone call, and put a catch to are used with typically local meanings. The localized innovations, then, have a "code-related" dimension and a "context-related" dimension. These are two basic aspects which any research on ESP cannot neglect.

There is also the question of motivation: One distinguishing feature of the institutional varieties, as opposed to that of performance varieties, is that English is not used with an "integrative" motivation with the native speakers of English, but essentially with an "instrumental" motivation. The instructional materials clearly show such contextualization of English in the local sociocultural context.

However, the "integrative" motivation is of a different type: This point has not generally been well appreciated. The integration is not necessarily sought with the native users of English, but English is seen as a vehicle of integration within the sociopolitical context of the nation, or a wider region comprising several nations (e.g., South Asia, West Africa). In other words, English provides a link among the culturally and linguistically diverse groups. This is clearly evident in Singapore, Nigeria, India, and other nations. English thus becomes a language of national integration, political awakening, and cultural unification. As it were, the linguistic code is turned against the native speaker; a colonial language is nurtured and retained as a tool for emancipation, and more important for national resurgence: The native (localized) linguistic resources are additionally used for an approximation of localized discoursal strategies of various types (see Kachru 1982a and 1983b); for lexicalization from local languages see Kachru 1983a; and for creative texts (e.g., short stories, poems) by local creative writers in English see relevant sections in Bailey and Görlach 1982 and Kachru 1982b.

LOCALIZED VARIETIES AND ENGLISH AS AN INTERNATIONAL LANGUAGE

I will indulge here in self-plagiarism and repeat some points which I have discussed in several earlier papers. The question is: Does the recognition (and the use of) localized varieties of English necessarily mean that such recognition

will have adverse effects on the international intelligibility of English? If that happens, the argument that English is an international (or universal) language is defeated. This question certainly has validity and cannot be brushed aside.

The question has three aspects. First, the pragmatic aspect: We need international intelligibility for those users of English whose linguistic encounters entail international interaction and communication. The need for such communication is generally combined with adequate motivation for achieving intelligibility, comprehensibility, and pragmatic success. Those users of English whose functions do not entail such encounters need not, functionally speaking, aspire for proficiency in exonormative models. Equally important, native speakers of American or British English, who have extensive encounters with the users of a particular non-native variety should be encouraged to familiarize themselves with the characteristic features of the variety, and should show some awareness about its repertoire range. It is difficult to imagine an expatriate to be linguistically comfortable, for example, in Singapore without some familiarity with the basilect and its uses, interactional and creative. The same applies to the varieties of Indian English and Nigerian English.

The second aspect is that of implementation. I will not discuss this aspect here since this discussion forms part of several earlier studies, particularly Kachru (1985). However, one should point out that, unlike French, standardization and codification have very complex implications for English. Even if one recognizes the need for such international standards, one is at a loss to provide practical steps for such codification, other than the ones I have briefly discussed above in the context of acceptability.

The third aspect brings to the debate a variety of interrelated issues. Let me consider some of these here. In most of the nations of South Asia or Southeast Asia, English has a long tradition of use as a language of politics, education, administration, and literary creativity. The identity with the language is deep, and its functional range and depth is considerable (See Kachru 1982). It would be unnatural to expect that the language would not be 'shaped' and 'molded' according to the local needs, and develop its variation due to the influence of local languages and literatures, cultures, and uses. The result of such deep-rooted local functions is that the intranational uses have been institutionalized. Additionally, in regional writing in English, the nativization is consciously used for creative purposes, as has been shown in, for example, Chishimba (1983), Lowenberg (1984), Nelson (1984 and 1985), and Magura (1984).

The intranational roles show a cline in use and a large number of users seem to engage in constant lectal shift,

involving acrolects, masolects, and basilects, depending on the participants in a linguistic interaction. Again, an evidence of this is found in Singapore, Nigeria, the Philippines, and Sri Lanka, to give just four examples.

TOWARD A SHIFT IN PARADIGM

The pragmatics of world Englishes clearly shows that in research on ESP, particularly for relevance in the Outer Circle, there is a need for shift in the paradigm. There is also a need for change in the methodology and in collection of appropriate empirical data. One also has to change the attitude toward the varieties of English and their users. What types of change can one suggest? The following are illustrative.

1. Recognition of the functional usefulness of the concept verbal repertoire, and a description of such a repertoire with reference to its societal meaning;

2. Recognition of the levels of pragmatic failure due to the inappropriate selection of the code. The non-recognition of localized lectal range has already resulted in various types of problems in English-using countries such as Singapore, Nigeria, and India;

3. Acceptance of localized innovations in ESP and the subvarieties within ESP (e.g., legal, administrative, advertising) as part of the pragmatic needs of the users; and

4. Recognizing the creativity in regional literatures in English as an extension of the local literatures and the 'literatures in English.' Such recognition will make it easier to select local texts for instructional purposes.

This recognition is not desirable only for functional reasons. It is also vital for several psychological and sociological reasons. This attitudinal change means accepting a hypothesis of code difference as opposed to one of code deficit. This is an important distinction since as teachers we are concerned with language-using human beings, and not merely with figures and percentages.

The last point brings in another dimension of non-native varieties of English which has traditionally not been considered as one of the concerns of ESP methodologists: The literary creativity in localized Englishes. Such contact literatures have certain textual and functional characteristics which set them apart as a body of writing in English. These texts need both linguistic and contextual explanations for a person who does not belong to the speech fellowship. Does this entail expanding the boundaries of ESP research? Perhaps it does. Contact literatures raise many theoretical and descriptive questions which are only recently

being raised (see Kachru 1983b and 1986; Smith forthcoming; and Thumboo 1985). The writers of such texts are bilingual or multilingual, but not necessarily bi- or multicultural. They are using English in contexts which give it new linguistic and cultural identities (see Nelson 1985). In this non-native creative use of English a distinctive ESP has developed which is not identical to British, American, or Australian writing in English. Consider, for instance, the creative writing of Singapore writers, Kripal Singh, Arthur Yap, and Cathrine Lim, or Sri Lankan writer Punyakante Wijenaike, or Indian writer Raja Rao.

In Kripal Singh's poem "Voices", Arthur Yap's poem "2 mothers in HBD playground", and Cathrine Lim's short stories "The Taximan" and "The Mother in Law's Curse" various linguistic devices are exploited to maximize pragmatic success in textual terms. "Voices" essentially uses mixing of codes, and Yap contextually "legitimizes" the use of mixing and the strategies of basilect. The lexicalization and basilectal constructions nativizes the text beyond the scope of a reader not familiar with the linguistic reality of Singapore. Consider, for example, the following linguistic features: jamban ('toilet bowl in Malay'), toa-soh ('drive in a car' in Hokkien), ah pah ('father' in Hokkien), what boy is he in the exam?, i scold like mad but what for, sit like don't want to get up, and so on. Lim provides convincing examples of code alteration appropriate to the functions and roles in Singapore.

The Sri Lankanness of Wijenaike's English, as Dissanayake and Nichter (forthcoming) have shown, is expressed through various linguistic and cultural exponents; her "food idioms," her "hot/cold dochotomy" and her use of silence as a speech act, are potent means for conveying cultural and linguistic "meaning". This meaning is missed if the text is divorced from the context in which it functions. We see the same stylistic experimentation in Raja Rao's novels Kanthapura and The Serpent and the Rope (see Parthasarathy forthcoming, Kachru 1983b and Dissanayake 1985).

It is through such devices and experimentation that in non-native literatures the H(igh) variety and L(ow) varieties are used as resources for creativity in English. There is, of course, a linguistic dilemma in this. If we evaluate such creativity in terms of the contexts and models of the Inner Circle, the innovations in the Outer Circle are considered 'deviant', therefore, resulting in pragmatic failure. If we view such experimentation from the perspective of a Singaporean, Sri Lankan, and Indian creative writer, it is clearly an appropriate use of the stylistic devices, it maximizes pragmatic success - to use the buzz word of our times.

What we need, then, is to extend the monolingual (traditional) stylistic norms of creativity in English, and to evaluate such Singaporean, Sri Lankan, and Indian texts with reference to new norms, and extended, linguistic, cultural, and interpretive contexts. In other words, recognize that functionally these non-native users of English have evolved a culturally and linguistically appropriate ESP.

Let me provide an illustration from English in advertising in Japan, which according to the three Concentric Circles belongs to the Expanding Circle of English. The pragmatic success of the Japanese innovations in this register must be seen within the context of Japanese attitudes to English, and their 'consuming passion' for English vocabulary (see Asiaweek, October 5, 1984:49). There is, therefore, a "social meaning" in the following 'deviations' (innovations):

1. Kanebo cosmetics: "for beautiful human life"
2. Tokyo Utility Company: "my life, my gas"
3. Shinjuku Station Concourse: "nice guy making"; "multiple days autumn fair"; "planning and creative" "let's communicate".

Now, it is rightly said that "to the English speaker they [vocabulary items] may be silly, childish, or annoying. Sometimes a double meaning makes them unintentionally funny. But the ubiquitous English of Japanese ads convey a feeling to a Japanese" (p. 49).

More important is the following observation concerning the psychological effects and commercial motivations of these phrases. I cannot resist the temptation of presenting the original quote here.

> To produce one such phrase requires the expensive services of an ad agency as sophisticated as anywhere. A creative director gathers the team and concepts are tossed about, a first-rate copywriter works on the theme, a lengthy rationalisation is prepared for the client, a decision eventually made to launch. Cost: maybe millions of yen. Everyone understands that it is sub-standard English. Explains a copywriter at Dentsu: "yes, of course we know it sounds corny to an American, even objectionable to some. But what the foreigner thinks of it is immaterial. The ad is purely domestic, a lot of market research has gone into it. It evokes the right images. It sells." For product names, English words that seem dismayingly inappropriate to the foreign listener are sometimes chosen. The most frequently quoted example is a very popular soft-drink called "Sweat." The idea of using a body secretion as an enticing name for a fluid to drink out of a can is just as unpleasant to a Japanese as to an Englishman, but "sweat" conjures a different image: hot and thirsty

> after vigorous activity on the sporting field. The drink's "Pocari" in Hongkong. Some English words enjoy a fad season. Currently very much in are "life," "my," "be," and "city," the last-named suffering from the phonetic necessity to render the "s" before "i" as "sh." My City is a multi-storeyed shopping complex in Shinjuku where you can ship for my-sports things to take to your my-house in your my-car. "New" remains popular. If no suitable English word exists, nothing is lost, coin one. Some, indeed, are accidentally rather catchy: "magineer." Others elicit only sighs. "Creap" is a big-selling cream-powder for coffee. Facom was perhaps not such a felicitous choice considering the open back vowel for Japanese. Currently in season are words ending in "-topia," presumable from "utopia." There was a Portopia, a Computopia and a Sportstopia. The brand-new Hilton Hotel boasts a splendid shopping annexe called the "Hiltopia." (Emphasis added; Asiaweek, October 5, 1984).

This is a very pragmatic statement, and clearly demonstrates that the norms for "English in advertising" are context bound and variety-dependent. This fact about non-native uses of English has yet to be recognized by the specialists in ESP. The advertising agencies in Japan seem to have seen the linguistic light.

There is another aspect of the use of multicodes (or lectal range) which touches us all as parents, teachers, students, and academic administrators. I am thinking of the varieties of English and their use in the classroom. The primary focus of such research on English, though very insightful, has been the linguistic behavior of the speech fellowships in the Inner Circle. It is the native context of the language functions, complexities of linguistic interaction, language attitudes, and interpretation of language use in the professions that has been the focus of attention. The Englishes of the Outer Circle, unfortunately, are still not part of this research activity.

The paradigm must change in another sense, too. We have to discard the exclusive use of deviational approach and evaluate the pragmatic success (or failure) of various codes with reference to the types of interaction and encounter within the intranational uses of English. The deficiency hypothesis, interlanguage hypothesis, and exclusively error-oriented approaches do not capture the sociolinguistic realism of the Outer Circle.

All the bees are not out of my bonnet yet. A number of points remain which are specific to ESP. In developing ESP we must adopt a pluralistic approach since English functions in pluralistic sociolinguistic contexts. This means a shift from the monomodel approaches to a polymodel approach. As a result

one would have to significantly modify one's approach to teacher training, curriculum development, and materials production.

CONCLUSION

The issues I have raised have wider and deeper implications. They touch delicate attitudinal chords of users of English internationally, and do not necessarily conform to traditional ESL/ELT paradigms. It seems to me that the consequences of not facing the pragmatic context of international Englishes are serious. The issues involved are linguistic, sociocultural, psychological, and educational. In his Presidential Address, delivered to the Linguistic Society of America in 1973, Dwight Bollinger emphatically told us that "truth is a linguistic question" (1973:539-550). The research of the last two decades has shown that linguistic issues do have educational, social, and psychological implications. And having seen that, we must pay heed to Bollinger's warning that "a taste of truth is like a taste of blood." Once the issues have been raised, it is the responsibility of the profession to explore their implications.

What is needed in research on ESP, then, is to provide a pragmatic basis to such research in terms of the world-wide uses of English, both internationally and intranationally. Swales (1985) has very insightfully drawn our attention to these issues. It is essential that the professionals in ESP/ELT reconsider the earlier paradigms of methodology, and their applications to the regions where institutionalized non-native varieties of English are in use.[9]

NOTES

[1]In three randomly selected catalogues of publishers for 1985 I found the following titles advertised: Cambridge University Press, English for Science and Technology, L. Trimble; Pergamon Institute of English, Bank on Your English, (M Pote et al.); English for Negotiating (J. Brims); Developing Reading Skills in ESP (includes volumes on biological sciences, physics, or medicine, telecommunications); Seaspeak (includes a Reference Manual, Training Manual, Teacher's Guide and Workbooks, Self-Study Course); The Language of Seafaring (P. Strevens); English for Maritime Studies (T. Blakey); English for Harbour Personnel (E. Joycey); English for Aeronautical Engineers (C. Sionis); Hotel English (P. Binham et al.); Restaurant English (P. Binham et al.); English for International Conferences (A. Fitzpatrick); Prentice-Hall, English for Adult Competency (A. Keltner et al.); Basic Adult Survival English (R. Walsh); Headlines (P. Karant); English for

Academic Uses (J. Adams et al.); Scitech (Karl Drobnic et al.); English in Context: Reading and Comprehension for Science and Technology (J. Saslow); Computer Notions (L. Rossi); The Computer Book (M. Abdulazia); Language From Nine to Five: Developing Business Communication Skills (K. Rietmann). I did not have the courage to open the more ambitious catalogues of Macmillan, The Regent Publishers, and so on.

[2]See, e.g., Kachru and Quirk 1982 and Kachru 1985.

[3]For various viewpoints on this question see Kachru 1976 and 1985, Prator 1966, Quirk 1985, and Smith 1981 and 1983.

[4]There is no need to labor the point that no language or variety of a language is intrinsically deficient. The attitudinal and functional acceptability of a language is an external matter, educational or social. The formal reasons which may contribute to such acceptance relate to the lexical stock of a language or variety, and to its register-range and style range. True, that these factors contribute to the "intellectualization" of a language and its functional efficiency in various contexts. The larger such "resources" of a language or a variety, the greater is its effectiveness as a language for "specific purposes". There are, of course, other factors too which determine acceptability: Academies, teacher trainers, academic administrators, the media, social pressure, and so on.

[5]For references to such studies see bibliographies in Bailey and Görlach 1982, Kachru 1982 and 1983a, and Smith 1981.

[6]In recent years there has been extensive theoretical and empirical research on this topic. For a detailed discussion and references see Kachru 1983a, the chapter entitled "On Mixing."

[7]For a detailed discussion of legal English see Mellinkoff 1963, also see Bhatia 1983 for the characteristics of legal texts.

[8]A number of other issues emerge which have been discussed in, e.g., Kachru 1983a and 1985, Y. Kachru 1985a and 1985b, Smith 1981 and forthcoming.

[9]This is a revised version of an invited paper presented at International Conference on English for Specific Purposes, organized by the Asia Foundation, the British Council and, the Ministry of Higher Education, Colombo, Sri Lanka, April 1-5, 1985. A slightly modified version of this paper will appear in the proceedings of the conference.

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APPLIED LINGUISTICS AND FOREIGN LANGUAGE TEACHING: A NON-WESTERN PERSPECTIVE

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In this paper, several issues have been raised with respect to standard paradigms of research in second language acquisition from the perspective of multilingual societies of the non-Western world. Data from institutionalized varieties of English have been brought to bear upon explanations in terms of interlanguage and fossilization. It has been argued that if discourse considerations are responsible for the non-nativeness of institutionalized varieties, as has been claimed in several recent studies, the non-native features can hardly be characterized as 'errors' and explained away as due to fossilization, overgeneralization, ignorance of rule restriction, etc. A number of questions have also been raised about the so-called 'approaches' to, or methodologies of, language teaching currently in favor on both sides of the Atlantic. It has been demonstrated that second language acquisition research needs to take into account the research findings of sociolinguistics in language and social identity, and bi-/multilingualism. Similarly, the research in teaching methodologies needs to be sensitive to the wider context of language teaching. Unless the data base of research in these areas is expanded, the claims to universality of research findings in second language acquisition and language teaching methodologies will remain suspect for most of the non-Western world.

Introduction

The field of foreign and/or second language teaching is so vast that it may be useful, at the outset, to indicate the exact context of my discussion. First, I will not make any distinction between foreign and second language teaching: This distinction is not very clear-cut from the perspective of a majority of non-Western countries. I will return to this point later. Secondly, as the issues arise, I will refer to second language acquisition, second language learning, and second language teaching, as all three are related in the context of language education.[1] Thirdly, I will confine myself to posing some questions for applied linguistics and language teaching. I am particularly concerned with the theoretical framework in second language acquisition research, and the methodology of second language teaching.

Second vs. Foreign Language

First, let me address the question of second vs. foreign language. It is true that historically speaking, for example, English and French are foreign languages in several parts of the world where they were introduced by the colonial powers. The countries where these two languages are used in the present post-colonial era are referred to as Anglophone and Francophone, respectively. In these nations, English

and French are no longer foreign languages, they are used intranationally for purposes such as administration, education, and legal services. Hence, they are the most prominent second languages in these countries. Nations where English has become a prominent second language are listed in 1 below.

(1) Non-English mother tongue countries where English has official status:

Botswana	Nauru
Burma	Nigeria
Camroon	Pakistan
Ethiopia	Philippines
Fiji	Sierra Leone
Gambia	Singapore
Ghana	*South Africa
India	Sri Lanka
Israel	Sudan
Kenya	Swaziland
Lesotho	Tanzania
Liberia	Tonga
Malawi	Uganda
Malaysia	Western Samoa
Malta	Zambia
Mauritius	Zimbabwe
Namibia	

(Fishman, Cooper and Conrad 1977:10,12)

(*The language situation is quite complex in South Africa, but is not relevant to our discussion.)

What is true of English in the above countries is true of French in the Francophone countries of Africa. In the following countries of Africa, French is the medium of education and hence, of administration, etc.

(2) Former French colonies where French is the medium of education:

Algeria	Mali
Benin	Mauritania
Burundi	Morocco
Central African Republic	Niger
Chad	Rwanda
Congo	Senegal
Djibouti	Togo
Gabon	Tunisia
Guinea	United Rep. of Cameroon
Ivory Coast	Upper Volta
Madagascar	Zaire

(Bokamba 1984)

What is true of English and French in the countries listed in 1 and 2 above is true of Spanish and Portuguese in Latin America. Since I am most familiar with the Anglophone parts of the world, my subsequent discussion will focus on English in non-native contexts. I will particularly concentrate on English as a Second Language (ESL) as a representative case of second/foreign language teaching. This is perfectly justifiable on the grounds that a great deal of research in the area of Second Language Acquisition (SLA) is devoted to ESL all over the world.

SLA Research: The State of the Art

As regards the paradigms of research in the field of second language acquisition, this area has been approached from four major standpoints in the past three decades. The first approach took the position that one's first or native language either helps or hinders one in learning a subsequent language. Therefore, a careful comparison of the structures of the native and target languages is essential for effective language teaching. This approach, known as the CONTRASTIVE ANALYSIS HYPOTHESIS, was advocated by such well-known linguists and language educators as Charles Fries and Robert Lado (Fries 1945 and Lado 1957). A number of contrastive analyses of well-known languages appeared and it was taken for granted that materials based on them would lead to better success in language learning. Good examples of such contrastive analyses are the works published by the University of Chicago Press on Spanish-English (Stockwell and Bowen 1965 and Stockwell, Bowen, and Martin 1965), German-English (Moulton 1962 and Kufner 1962) and Italian-English (Agard and Di Pietro 1965, 2 vols.) The bibliographies published by the Center for Applied Linguistics list several contrastive studies involving almost all major languages of the world (e.g., Gage 1961, Hammer and Rice 1965; see also Dechert, Brüggemeier and Fütterer 1984).

Soon, however, disillusionment set in and experienced language teachers as well as researchers began to point out that contrastive analysis had limited predictive value. It was argued that simply on the basis of a comparison of the native and target languages, teachers will not be able to identify what causes most difficulty in learning the various sounds, words, and sentence patterns of a given target language. The errors that the learners make are not always what contrastive analysis predicts: It is not always the case that the errors made by the learners have their source in their native languages (e.g., Lee 1968, Duškova 1969). Researchers also pointed out that some of the errors learners make are similar to, or even identical with, the errors made by children learning the target language as their first language (e.g., Ravem 1968 and 1974). Emphasis thereafter naturally shifted to the learner errors. Studies by Corder (1967 and 1971), Dulay and Burt (1974) and others pointed out that systematic errors provide clues to the progress that learners make in their learning task. Hence, ERROR ANALYSIS is more relevant as compared to contrastive analysis as the paradigm of research in second language learning (e.g., Dulay and Burt 1974).

The emphasis on learner-centered approaches soon resulted in a more comprehensive framework for studying second language learning

or acquisition. The new approach incorporated the techniques of contrastive analysis and error analysis and became known as the INTERLANGUAGE HYPOTHESIS (Selinker 1972). This hypothesis stipulated that systematic learner errors provide clues to the process of learning. A periodic study of such errors, and a comparison of learner performance in the target language with the native and target language systems, will identify the successive stages of learning. At each stage, learners have an interlanguage system that is different from their native as well as the target language system that they are attempting to acquire. A learner progresses through several stages of interlanguage before acquiring competence in the target language. In a majority of cases of adult learners,native-like competence in the target language is difficult to achieve. Even at the most advanced stages of the interlanguage, adult learners have traces of fossilization of their native language, or of an interlanguage, features in their target language system. The interlanguage hypothesis, incorporating the insights of earlier approaches and concepts such as fossilization, is by now well-established.[2]

The interlanguage hypothesis represents a general acceptance of the assumption that second language learning is similar to first language acquisition (Dulay and Burt 1976). This in turn has led to investigations of learner errors in terms of language universals. It is claimed that an explanation for errors in learner performance can be found if it could be established that it is the marked structures of the target language that cause learning problems (Eckman 1977). An example of this phenomenon is the following: Relative clause formation in English is marked in the sense that it involves, in addition to the use of appropriate relative pronouns, the fronting of the relative pronoun and hence a change in word order within the relative clause. For instance, in the sentence I would like to see the book which you recently bought, the relative pronoun which is understood as referring to the object of the verb buy, and yet the word order is not you bought which. As a consequence of the front shifting of the relative pronoun, the structure becomes complex and difficult to acquire from the point of view of a learner. As this hypothesis is attractive to researchers interested in linguistic universals, it has been adopted by a number of them.

Recent Trends in SLA Research

This emphasis on linguistic structure to explain language learning was not acceptable to all. A number of researchers proceeded to demonstrate that language learning and teaching do not involve language structure only. Rather, successful language learning involves competence in communicating one's ideas, beliefs, needs, etc., in various types of linguistic interactions.

The activities of the Council of Europe dealing with the problem of teaching European languages to immigrant workers in Western Europe and Britain ultimately resulted in the development of a new approach labelled COMMUNICATIVE LANGUAGE TEACHING. According to this approach, what language teaching and learning have to deal with is the use of language in social interactions rather than a mere mastery of the skills of pronunciation, grammatical structures, vocabulary, etc. The main issue in teaching is how to equip the learners with the capability to use the target language appropriately in various social situations to achieve their communicative goals. This approach and related methodology

were first proposed in Wilkins (1976) and later elaborated in Munby (1978). By now, the communicative approach to language teaching has gained wide acceptance on both sides of the Atlantic.[3] It should, however, be noted here that the underlying theoretical and methodological insights for these approaches were provided by linguists and sociolinguists such as J. R. Firth, Dell Hymes, and M. A. K. Halliday.

SLA: A Non-Western Perspective

Approaching second language teaching and learning from a non-Western perspective opens up a whole new range of issues not normally addressed in the approaches discussed above. The issues of literacy and language in education are inextricably tied in with the issue of language teaching and learning in those areas of the world where English, French, Portuguese, and Spanish are the media of education without necessarily being the native languages. In Ivory Coast, Kenya, Singapore, and South Asia, to name just a few nations, it is not a question of teaching French or English as a second language, but a question of teaching literacy skills, mathematics, sciences, history, etc., through French or English. Thus, the whole issue of teaching a second language is linked with questions of language policy and planning. (See ARAL 4, 1983 for a discussion of literacy in several regions of the world, and Rubin and Jernudd 1975 and Cobarrubias and Fishman 1983 for questions of language policy and planning in developed and developing countries.)

It is worth noting that in a majority of the nations of the non-Western world (e.g., the ones listed in 1 and 2 above), it is not a question of 'bilingualism or not' (Skutnaab-Kangas 1984),[4] as is clear from the data in 3 below.

(3) Language profile of selected countries of the non-Western world:

a. India: Number of mother tongues reported in the census: 1652. These belong to four language families: Indo-Aryan, Dravidian, Austro-Asiatic, and Sino-Tibetan. Official languages: Hindi and English. Media of higher education: sixteen major languages and English.

Kenya: Four major languages: Swahili, Gikuyu, Lubya (Bantu family), and Luo (Nilotic family). Official languages: Swahili and English. Medium of higher education: English

Singapore: Three major ethnic groups: Chinese, Malay, and Tamil. Languages: Several Chinese dialects, Malay, and Tamil. Official languages: Mandarin, Malay, Tamil, and English. Medium of higher education: English.

It is clear from the above that a majority of the population in these countries is bi-/multilingual and has been for centuries. Thus, concerns of bi-/multilingualism are extremely relevant for research on second language acquisition from the point of view of these countries.

The Case of Non-Native Varieties of English

I would like to elaborate on these concerns with one example. The case in point is that of English around the world. In many of the countries where English is used either as an official language, as a language of higher education, or for international trade and commerce, diplomacy, etc., varieties of English have developed which are not identical with the native varieties used in Australia, Britain, Canada, New Zealand and the United States of America (see Bailey and Görlach 1982, B. Kachru 1982, 1983, Platt, Weber and Ho 1984, Smith 1983, among others, for details regarding these varieties). In some of these varieties there is a considerable body of creative literature. The perceptions of some of the users of these varieties is given in 4 below.

(4)a. Most Singaporeans recognize the fact that they speak English differently from the so-called "native speakers" of English. ... They accept these differences but are quite content to speak English their "own" way as long as they can be understood by fellow-Singaporeans and foreigners.
(Richards and Tay 1981:54)

b. I feel that the English language will be able to carry the weight of my African experience. But it will have to be a new English, still in communion with its ancestral home but altered to suit its new African surroundings.
(Achebe 1965:30)

c. I am an Indian, very brown, born in
Malabar, I speak three languages, write in
Two, dream in one. Don't write in English, they said,
English is not your mother-tongue. Why not leave
Me alone, critics, friends, visiting cousins,
Everyone of you? Why not let me speak in
Any language I like? The language I speak
Becomes mine, its distortions, its queernesses,
All mine, mine alone. It is half English, half
Indian, funny perhaps, but it is honest,
It is as human as I am human, don't
You see? It voices my joys, my longings, my
Hopes, and it is useful to me as cawing
Is to crows or roaring to lions, it
Is human speech, the speech of the mind that is
Here and not there, a mind that sees and hears and
Is aware. Not the deep, blind speech
of trees in storm or of monsoon clouds or of rain or the
Incoherent mutterings of the blazing
Funeral pyre. ...
(Das 1980:38-39)

Some of the linguistic features that make these non-native varieties different from the native varieties of English are given in 5 below. (See B. Kachru 1982, Platt, Weber and Ho 1984, Smith 1981, among others, for details).

(5) Phonology:
Different stress placement in words (the syllable preceding ' is stressed):

a. Filipino: laborato'ry, chara'cterized, circu'mstances
b. Singaporean: facu'lty, educa'ted, conte'xt, prefere'nce
c. Indian: de'velopment, chara'cter
d. Nigerian: su'ccess, recogni'ze, investiga'te
(Lowenberg 1984b)

Lexicon:

a. Singaporean: Handicaps on our island republic get stares wherever they go.
(Lowenberg 1984b)
b. Indian: What are the subjects you offered at B.A.?
(Lowenberg 1984b)
c. Ghanian: He does not use a chewing stick to clean his teeth.
(Lowenberg 1984b)
d. East African: He overlistened to the boy's conversation.
(Hancock and Angogo 1982:318)

Syntax:

A. Countability of non-count nouns:

a. Filipino: He has many luggages. (Gonzales 1983)
b. Singaporean: Give me a chalk. (Lowenberg 1984b)
c. Nigerian: I lost all my furnitures and many valuable properties.
(Bokamba 1982:82)
d. Indian: There are historical as well as synchronic evidences which can support separating of aspiration from stops.
(IL 35:3, 1976:230) [5]

B. Resumptive pronouns:

a. Arab: the time I spent it in practice
b. Chinese: We put them in boxes we call them rice boxes.
(Schachter 1976)
c. Nigerian: The politicians and their supporters, they don't often listen to advice.
(Bamgbose 1982:106)

C. Tenses:

a. Singaporean: Are you feeling lonely, bored or having no time to get friends?
(SM July 7, 1984:5)
b. Indian: You are all knowing, friends, what sweetness is in Miss Pushpa.
(Ezekiel 1976)

Interlanguage or bilingual's creativity?

The above examples and similar data from non-native varieties of English give rise to several questions. The first question is

whether the differences observable in the data are due to overgeneralization of target language features or transfer from the native languages. The difficulty is that this question is not easy to answer. To take one example, there is no consistent semantic basis for marking the count/non-count distinction in English nouns, especially in the case of collective and abstract nouns. In such cases, learners simply follow the conventions of their own native languages (cf. examples in A above). Similarly, in the case of resumptive pronouns (cf. examples in B above), Schachter and Celce-Murcia (1980) argue that such structures in the performance of Chinese and Japanese learners are motivated by the topic-comment structure of their native languages. Hatch (1978b) claims the same about the use of articles (a, an, and the) in the English of Spanish speakers. In Hatch (1978b), it has been pointed out that an analysis of total texts produced by Spanish speakers reveals the fact that these learners follow the Spanish convention of use of indefinite and definite articles in their English. This learner strategy leads to fewer errors in the use of the, but a greater number of errors in the use of a/an.

The following examples from various localized forms of English provide further support for the claim that learners follow the discourse conventions of their native languages which results in their using specific grammatical devices of English in a non-native fashion.[6]

Discourse:

a. Indian:
... The position has belonged to such actresses who come to personify, at any given moment, the popular ideal of physical beauty ...

(IT, September 30, 1983:39)

... They are brought up in such an atmosphere where they are not encouraged to express themselves upon such subjects in front of others ...

(HLI: 194-195)

The use of such as a correlative of who and where in the above examples reflects the conventions of use of cohesive ties (Halliday and Hasan 1976) in Indian languages such as Bengali, Hindi, Marathi, Punjabi, and others.

This leads to a further question: if the features identified as unique to non-native varieties of English are motivated by discourse considerations, as has been demonstrated in studies such as Chishimba (1983), B. Kachru (1982, 1983, 1984), Y. Kachru (1982, 1983, 1984), Lowenberg (1984a), Magura (1984), among others, then how can they be considered instances of fossilization? How can we distinguish cases that exemplify discourse strategies from cases that provide evidence for fossilization? What theoretical justification, if any, is there for characterizing features of non-native varieties as fossilization and of the varieties themselves as interlanguages? Which characteristics of the non-native varieties, as encountered in creative literature

or mature writing (i.e., by journalists, critics, authors, etc.), are to be treated as illustrations of bilingual's creativity as opposed to fossilization, overgeneralization, or ignorance of rule restrictions? These questions are serious; they cannot be swept under the rug. As has been stated above, most of the institutionalized non-native varieties are being used in their respective regions as media of higher education, administration, and for social interaction. To label them interlanguages denies vast populations of these countries a legitimate language for conducting their business.

Obviously, the question of a model of English for education and other purposes is crucial for the non-Western world (B. Kachru 1976 and 1982). As far as the users of the non-native varieties themselves are concerned, they are not in favor of a 'foreign' model, as is clear from the following tables:

(6) a. Variety of English presently spoken by educated speakers:

	Singaporeans %	Indians %	Thais %
1. British	40.5	27.4	6.5
2. American	6.0	3.2	28.1
3. Australian	0.6	0.0	0.0
4. Unique	42.3	50.6	40.3
5. Others	10.6	18.8	25.1

b. The variety that we should learn to speak:

	Singaporeans %	Indians %	Thais %
1. British	38.3	28.5	49.1
2. American	14.4	12.0	31.6
3. Australian	0.6	0.3	0.3
4. Own way	38.9	47.4	3.5
5. Others	7.8	11.8	15.5

(Shaw 1981:119-120)

(These results were obtained in a survey conducted among final year Bachelor degree students in Singapore, Hyderabad (India), and Bangkok (Thailand). There were 170 Singaporean, 342 Indian, and 313 Thai students.)

c. Indian graduate students' self-labeling of their English:

Identity marker	%
American English	2.58
British English	29.11
Indian English	55.64
'Mixture' of all these	2.99
I don't know	8.97
"Good" English	.27

(B. Kachru 1976:232)

(Kachru 1976 presents the results of a survey carried out in India that involved 700 Bachelor and Master's degree students in English, and 196 members of faculty and 29 heads of departments of English.)

It is clear from the above data that unlike the countries where English is used only for international purposes (e.g., Thailand), the institutionalized variety users prefer to characterize their English as their "own" rather than to conform to some "native" English norm. The tables in 6 support the sentiments expressed by scholars and creative writers in 4 above.

Communicative needs and the uses of English

Looked at from the point of view of communicative needs of the users of the localized forms of English, it is clear that the adoption of these varieties as models for teaching and learning in their respective regions is entirely justifiable. The differences that these varieties exhibit serve specific sociocultural needs such as satisfying certain conventions of linguistic interactions, whether through an oral or written mode. The following excerpt from an Iraqi news report demonstrates this dramatically.

(7) In the name of God, the merciful, the compassionate.

> Great Iraqi people, sons of the glorious Arab nations, it has been known to us from the beginning that many parties local international, were and still are behind the eagerness of the backward and suspect Iranian regime to stir up the dispute with, and conduct aggression against and begin the war against Iraq.
>
> (from B. Kachru 1982:340)

The above are the opening paragraphs of an official statement about the destruction of the Iraqi Osirak nuclear reactor by the Israeli forces in June 1981. The point of the story - the attack by Israeli forces - is mentioned in one sentence after five such short paragraphs. Such elaborate build-ups before coming to the point of a story is not unique to Iraqi Arabic. To quote Chishimba, "In the cultures of Africa, loquacity, ambiguity, redundancy, obscurity and other strategies of verbal discourse are markers of wisdom, age, knowledgeability, sex, and other socially relevant criteria." (Chishimba 1982:246-247).

What is suggested is that the unique features of non-native varieties deserve to be treated as evidence for bilingual's creativity rather than as evidence for fossilization (a la Selinker 1972), ignorance of rule restrictions, deficiency, etc. In cases where such features occur in literary texts, we have less difficulty in accepting them as stylistic innovations (Nelson 1984a, 1984b). In the case of expository prose or ordinary speech, however, there is an attitudinal factor that labels such innovations "un-English." Considering the range of variation in dialects within a native English-speaking country, and in varieties across different native English-speaking countries, it is not unreasonable to suggest that certain features of non-native varieties be accepted as legitimate variations. After all, the non-native variations in 8 below are no more severe than the native ones.

(8) British: Have you had your holiday yet?
American: Did you have your vacation yet?
(Strevens 1977:149)

British: different from, to
American: different than
(Strevens 1977:150)

Singaporean: So you have to go turn by turn.
(Platt, Weber and Ho 1983:48)

African: ...we are seven and a half million strong and quite a number of these can not get jobs to do, so we should cut down on bringing forth.
(Bokamba 1982:88)

Indian: The concept of idiolect I do not know if people still talk about it.
(IT 35:3, 1974:229)

This entails a new theoretical framework for research that starts with the assumption that people learn languages in order to fulfill certain communicative needs which may not coincide with the needs of the native speakers of the target language. Consequently, second language users develop their own strategies which result in differences at each level of the target language structure as well as conventions of its use. Second language acquisition research thus has to take into account the findings of research in bi-/multilingualism.

Issues in methodology

As regards the question of methodology, several methods have been proposed, adopted for a short time, and discarded as the fashions change in second language pedagogy (Richards 1984). Very little empirical evidence is available to support the claims of effectiveness for any particular method, and yet, scarce resources continue to be invested in following 'the trend' in ESL classrooms. In the eighties, there is a definite shift from the audio-lingual method to the communicative approach in the classroom, but, unfortunately, neither approach, as currently conceptualized, takes any notice of the situation in non-Western countries. The following is typical of many of the countries listed in 1 and 2 above.

(9) Teaching English in Gambia:

a. General teacher information:

Gender	Qualifications	Qualifications by gender
67% male	27% qualified	28% men qualified
33% female	73% unqualified	25% women qualified

b. Bi-/multilingualism:

Average teacher speaks 2.8 languages, one of which is English.

34% bilingual, 48% trilingual, 15% speak four languages, 3% speak five languages.

c. Patterns of language use: English used for banking; in linguistic interaction with the head teacher and other teachers; in teaching mathematics, sciences, social studies; in praising children for their performance; occasionally in interacting with the parents of children; occasionally in interacting with one's spouse, children and friends.

(Bowcock 1984)

There is an urgent need for research in the area of suitable methodology for language teaching in crowded, sparsely equipped classrooms as compared to the type of classrooms we are familiar with. Recently, a group of English teachers and teacher trainers from selected non-Western countries visited a number of TESL programs at U.S. universities. Their typical concerns were as follows:

(10) Pakistan: (college-level teaching)

Two of her biggest problems are large classes (100-200 students) and lack of sophisticated resources. She would like to learn as much as she can about strategies for teaching large classes and where to find (or how to make) inexpensive visual aids.

Sudan: (high school teacher training)

60-80 students are often in one class; what can be learned on this trip to help teach in this environment?

One can always take the position that these are impossible situations and ignore the whole question. As applied linguists, teacher trainers, teachers, and educators, however, I hope we accept the challenge instead.

Conclusion

In conclusion, we need serious, basic research that will lead us to adequate descriptions of English and other languages of wider communication around the world in their varied sociolinguistic contexts. This has to be accompanied by applied research in teaching methodology and curriculum and materials development. At the present state of our knowledge regarding what makes second language learning possible, it is more useful to encourage different methodologies, both tried and familiar methods as well as new ones, rather than to throw out any as being out-dated. As suggested in Diller (1981), different methods and classroom practices utilize different areas and different pathways of the brain and result in better success in learning. From a non-Western perspective, these are the challenges that applied linguistics and foreign language pedagogy face today.

NOTES

[1]Theoretically speaking, a distinction is made between second language learning and second language acquisition. Second language learning is said to be a conscious process that involves instruction whereas second language acquisition is characterized as a natural, unconscious process. Learning and acquisition are both learner-centered

as opposed to teaching, which is teacher-centered and does not take into account factors related to learners such as age, attitude, motivation, the difference between input (provided in the classroom) vs. intake (internalized by the learner), etc. There is, however, some doubt as to whether the distinction between learning and acquisition is so clear-cut (Diller 1981).

[2]See Sridhar (1980) for an insightful discussion of contrastive analysis, error analysis, and interlanguage.

[3]This is clear from recent publications meant for language teachers (and teacher trainers), e.g., Widdowson (1978), Brumfit and Johnson (1979), Finnochiaro and Brumfit (1983), and Savignon (1983).

[4]'Bilingualism or not' is the main title of Skutnaab-Kangas (1984) which contains a detailed discussion of the problem of minority education in Europe. The need for guest workers or immigrant laborers in the industrialized nations of Europe has created a situation where it is becoming increasingly obvious that the immigrant workers and, more importantly, their children have to have access to bilingual education if these nations are to avoid a great deal of social and political unrest.

[5]In addition to the sources listed in the References the following have provided additional data discussed in this study:

HLI = Singh, Amrik and P. G. Altbach, eds. 1974. The higher learning in India. Bombay: Vikas Publishing House; IL = Indian Linguistics, the journal of the Linguistic Society of India; and IT = India Today, a bimonthly magazine, comparable to Time. The quotes in this paper are from the overseas edition.

[6]I do not mean to suggest that all attested differences between native and non-native varieties are motivated by discourse considerations. Obviously, non-native varieties, too, just like the native varieties, have a range of dialect variation (e.g., basilect, mesolect, and acrolect in Singapore discussed in Lowenberg (1984a)). Also, in any body of attested data, it is likely that there will be a number of 'mistakes', whether the data is from a native or a non-native variety. What I am concerned with here is the variation that is due to discourse considerations. Most such innovations in non-native varieties result from restricting or extending the domains of specific devices of English, e.g., in the example in 5 under discourse, Indian English extends the function of such to a correlative of the relative pronouns who and where. It is worth remembering that such does function as a correlative in the constructions such as and such that in native varieties, too.

[7]See Davidson (1980) for a description and illustration of various methods practiced currently in the ESL classrooms.

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SENTENCE PARTICLES AS EVIDENCE FOR MORPHOSYNTACTIC INTERACTION WITH PRAGMATICS

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Abstract

In this paper we argue that sentence particles (SPs) in languages like Japanese, Korean and Thai must be treated as phrasal affixes which combine in the syntax with syntactically constructed phrases. This accounts for the observed correlations between the placement of SPs and their scope within the sentence. In order to provide the theoretical background for the analysis, we appeal to the overall framework of morphosyntactic interaction proposed in Kendall and Yoon (1986) and Yoon (1986) within which the our ideas can be implemented. We show that the behavior of SPs closely paralllels that of other phrasal affixes posited in our earlier works. We then discuss the possibility of alternative treatments of SP scope facts in the morphosyntactic frameworks of Autolexical Syntax (Sadock 1986) and that of Marantz (1984, 1985) and entertain the possibility that SPs might be clitics whose behavior is best accounted for by postsyntactic readjustment rules. We highlight the differences between our analysis and the alternatives and conclude by addressing some unresolved questions in morphosyntactic interaction brought forth by the discussion in the paper.

1. INTRODUCTION*

In the past, when linguists have looked at the speech act properties of language, such as illocutionary force, illocutionary commitment and speaker attitudes, they have concentrated on how these properties are conveyed in English or related European languages. Even people who propose "universal" theories of speech acts base their analysis on Western languages (cf. for example Searle and Vandervecken 1985). A problem arises from this European bias that has to do with the fact that in these languages illocutionary force is not usually indicated morphosyntactically, as shown in (1).

(1) Why don't you take out the trash?
(interpreted as a command)

Further, if illocutionary force (or any other speech act property) is

indicated through morphosyntax, it is marked by the use of a word or morpheme that also has a non-performative descriptive use in addition to a performative use, such as is the case with performative verbs in English.

(2) a. I order you to re-examine the trashcan.
(illocutionary force of ordering/commanding)

b. I ordered you to re-examine the trashcan.
(order as non-performative)

Looking only at systems like English leads naturally to an analysis of speech acts that concentrates only on the semantico-pragmatic features of utterances, e.g. how structure is assigned to the set of illocutionary forces, how to determine the conditions of success for a given speech act, or simply how to determine an utterance's illocutionary force.

Focusing on the semantico-pragmatic aspects of speech acts is, of course, a worthwhile endeavor, and this line of investigation has led to many useful insights about the nature of speech acts. However, a natural consequence of the European language bias of current speech act theories, such as those of Searle (1979, 1983), Searle and Vandervecken (1985), Bach and Harnish (1979), Levinson (1983), is that the models they provide have little to say about some of the speech act properties of certain languages, namely those which have morphemes whose sole function is to indicate speech act properties.[1] The languages we look at in this paper are Japanese, Korean, and Thai,[2] and examples of these pragmatic morphemes, which show up as sentence particles (SPs) are illustrated in (3)-(5).[3]

(3) JAPANESE Kare-ga shukudai-o shi-te-imasu-yo
he-NOM homework-ACC do-prog-be-SP
'He is doing his homework (I tell you!)'

(4) KOREAN k+-ga sukjay-l+l ha-go-iss-ta-ne
he-NOM homework-ACC do-prog-be-mood-SP
'(I am surprised that) he is doing his homework.'

(5) THAI kʰǎw kamlang tʰam kaanbaan yuu lɤ́ɤ-ná-kʰá
he prog do homework prog asp SP speaker-sex
'He is doing his homework (I tell you!)'

Thai has the largest number of SPs, and they are used to convey many different kinds of attitudes (cf. note 4 below), and Japanese has a good number of SPs as well, although they are used to indicate a more restricted range of attitudes. Korean has a much smaller and less flexible set of SPs, but they are nonetheless very common in conversation.

An interesting fact about these languages is that they not only have special "pragmatic" bound morphemes which do not have descriptive uses like performative verbs in English, but also that the morphosyntactic placement of these bound morphemes seems to correlate strongly with what can be considered as their "scope" in a sentence.

SPs typically convey speaker attitudes or commitment associated with

the illocutionary force of the entire sentence[4] when they occur finally in a sentence. However, when these SPs occur clause-internally, their domain of modification extends to just the phrase headed by the word they are attached to morphologically. In other words, they show systematic variations in "scope" depending on their placement in the clause. Their behavior in this regard is similar to that of domain adverbs whose domain of modification (or "scope") correlates with their positions in a sentence (cf. Ernst 1985). This is illustrated by the contrast observed between (3)-(5) on the one hand, and (6)-(7) below.

(6) JAPANESE:

a. [kono hon-wa]-ne, omoshiroi-desu
this book-TOP-SP interesting-COP
'Hey, this book is interesting.'

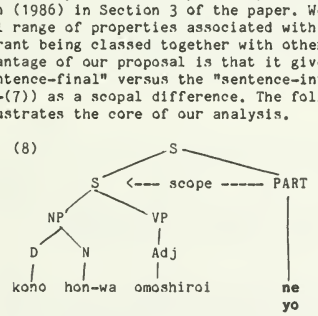
b. [tokoro-ga]-sa [umaku ikanakute]-sa komachatta
but SP well didn't go-SP was in trouble
'But it didn't go well and I was in trouble.'

(7) THAI:

ŋən nâ?, kʰray-kʰray kɔ̂ yàak-dâay
money SP anybody PART want
'Money! Everybody wants it!'

Our main claim in this paper is that if the SPs are analysed as attaching to syntactically constructed phrases, then their scope can be straightforwardly calculated since they incorporate the clauses or phrases that they have in their scope. As justification for the proposed analysis, we appeal to the arguments for the necessity of recognizing phrasal affixation put forth independently of SPs in Kendall and Yoon (1986) and Yoon (1986) in Section 3 of the paper. We show that SPs also exhibit the full range of properties associated with phrasal affixes and therefore warrant being classed together with other phrasal affixes. An immediate advantage of our proposal is that it gives a unified account of the usual "sentence-final" versus the "sentence-internal" uses of SPs (cf. (3)-(5) vs. (6)-(7)) as a scopal difference. The following schematic representation illustrates the core of our analysis.

(8)



Although this proposal may seem relatively harmless to some, and would surely have been accepted in the early seventies when lexical decomposition was in fashion, such is no longer regarded as innocuous under the currently

accepted thesis of Lexical Integrity (Bresnan 1982; Lapointe 1980)) which prohibits syntax from referring to word structure.

The Lexical Integrity Hypothesis is associated with lexicalism, dating back to Chomsky (1970), and characterizes (explicitly or implicitly) most current syntactic frameworks, although the existence of Affix Hopping in GB runs against other aspects of the theory consistent with Lexical Integrity Lexical Integrity indeed is forced by the commonly accepted view of the overall organization of the grammar where lexical insertion takes place before any syntactic operation is done (i.e. before deep structure) and no interface between lexical rules and syntactic rules is envisaged (Wasow 1977). The LIH has been a guiding principle in recent lexicalist syntactic theories and has often been cited in the criticism of the inconsistency of GB with respect to this principle, since mixing morphology and syntax is seen as undermining the autonomy of the two components.

Despite the fact that what we propose is inconsistent with LIH, we argue in Section 3 that it is not only plausible but apparently necessary to recognize affixation in syntax quite apart from the question of SP scope. We establish certain properties of phrasal affixes and show that SPs show all of those properties. The framework of morphosyntactic interaction we adopt in this paper leads us to abandon the Lexical Integrity Hypothesis as it is stated but we seek to save the generalizatin concerning the autonomy of the domains of syntax and the lexicon sought under the LIH although we allow some morphology in the syntax.

Before presenting the theoretical framework, in Section 2 we go over why previous investigations of SPs prove to be inadequate to account for either their semantico-pragmatic properties or their syntactic scope. In Section 4 we consider alternative frameworks which seem capable of accounting for the range of facts we observed in this paper and consider the consequences of treatment of SPs for each of these frameworks as well as the plausibility of modifying these models to suit our needs. Section 5 concludes the paper by considering the issue of morphosyntactic interaction raised in this paper and pointing out some remaining problems and prospects for future research.

2. PREVIOUS WORK ON SPS

In this section we briefly go over work on SPs that is relevant to our discussion of the syntactic scope of pragmatic particles. First we list the precedents for claiming that SPs are pragmatic particles. Then we examine how past scholarship has dealt with the issue of lexical integrity and SPs. Finally we note that the syntax of SPs has been largely ignored.

2.1. SPs as Pragmatic Markers

The earliest discussions of SPs come from traditional descriptivist accounts of Japanese, which look only at the so-called semantic properties of SPs. They are claimed to be "mood" markers, but what descriptivists call mood in Japanese is not the same [syntactic marking of] "mood" found in some Indo-European languages, such as indicative vs. subjunctive. Instead, "mood" refers to <u>emotional</u> moods of speakers (cf. Takahara 1972). Peyasantiwong

also labels a large class of Thai SPs as mood particles (1981: 28). Realizing that "speaker moods" fall into the realm of pragmatics, others began to look at the conditions for felicitous uses of SPs, and discussions of SPs as "politeness markers" began to appear. In fact, the major discussions of Thai and Korean SPs have been in terms of politeness (cf. Peyasantiwong 1981; Cho 1982). The Japanese SPs are also often viewed in terms of their politeness or how speaker/hearer sex roles affect their felicitous use.

The rise of Generative Semantics led people to link SPs with illocutionary force. For example, Uyeno (1971) labels Japanese SPs "performative higher predicates". Even after the idea of SPs as higher predicates lost favor, they have been linked with illocutionary force, as in Givon's (1982) scalar analysis of Japanese SPs as ranging from [+interrogative] to [+declarative],[5] and Cho's claims that Korean SPs can strengthen or weaken illocutionary force [1982: 11]. We assume in this paper that the pragmatic function of SPs is to indicate certain speaker attitudes about utterances rather than marking politeness or illocutionary force per se (cf. Kendall 1985; 1987; for justification). However, what is relevant to this proposal is that SPs are a unique class of particles with no descriptive non-speech-act function, but which serve exclusively as markers of speech act properties.

2.2. Lexical Integrity and SPs

There are two obvious approaches to SPs with regard to the LIH: SPs may be free morphemes or they may be bound to the words that precede them. Both approaches are represented in the literature. Thai SPs are generally treated as free morphemes, mainly because Thai is usually analyzed as an isolating language. However, Noss (1964) claimed that SPs are bound morphemes, and further that one of the determining factors for considering a final particle as an SP is bound morpheme status (1964: 200; cited in Peyasantiwong: 9). As for Korean SPs, Cho (1982) includes them in the verbal complex, along with other pragmatic markers such as subject honorific affix -si-.

Whether Japanese SPs are treated as free or bound morphemes depends on the analysis. For Uyeno they are independent free morphemes, as she considers them performative predicates, while those who consider SPs as part of the Japanese modality system tend to suffix them to the verbal complex as well.

Although these authors present little evidence to justify their respective choices, we choose to go along with those who treat SPs as affixes, if only because it is the traditional analysis. Besides this, the V-SP complex acts like a "word" in that it cannot be interrupted by conjunctions or parentheticals, and thereby it conforms to Sadock's (1980) criteria for wordhood. And, at least in the case of Uyeno's analysis of Japanese, there is little justification for calling them free morphemes. She does so only because her analysis forces SPs to be higher predicates and verbs are typically free morphemes. However, since other morphemes Generative Semanticists treat as higher predicates (like -sase 'cause to V') are bound affixes, her analysis would not suffer if SPs were treated as

affixed as well.

2.3. Syntax of SPs

The syntax of SPs is by and large ignored. Usually they are assumed to simply appear affixed to words at the ends of sentences or phrases, and since they have no "interesting" properties, their relationship to other phrasal categories is not examined. The systematic scopal differences between sentence-final and non-sentence-final SPs rarely come up, mainly because non-sentence-final uses aren't dealt with in traditional descriptions of Japanese. The exception is Martin (1975), who lists examples, but does not commit himself to any syntactic theory or its predictions. Uyeno mentions the non-sentence-final SPs (1971: 49), but dismisses them as some other part of speech, most likely because they would otherwise cause problems for the performative hypothesis.

3. A THEORY OF PHRASAL AFFIXATION

3.1. The Lexical Integrity Hypothesis versus Phrasal Affixation

Our claim in this paper is that the observed correlation between the scope of SPs and their morphosyntactic placement falls out from the fact that SPs are phrasal affixes which combine with syntactically constructed phrases. Under this view, since the SPs are syntactically sisters to phrases with which they combine, they thus c-command the phrase over which they have scope. Therefore, the scope of SPs will fall out naturally. In this way we capture the traditional observations that SPs are attached to sentences whereas morphologically they are affixed to the last word of a sentence.

On the other hand, if we adopt the LIH and treat SPs as an unanalyzable part of the words to which they are affixed, it is not obvious that we can explain the fact that SPs seem to have sentential scope just when they are affixed at the end of the clause and otherwise show scope only over the constituents they are attached to (cf. (3)-(5) vs. (6)-(7)). Furthermore, if the morphosyntax of SPs is irrelevant to the scope they bear in a sentence, then there is no reason why the sentence internal instance of the SPs cannot have sentential scope and vice versa. Thus, any analysis in keeping with the strict lexicalist assumption of Lexical Integrity is unable to account for the observed scope correlations in a principled way and is forced to conclude that the morphosyntax of SPs is irrelevant to their scopal properties.

Our analysis, on the other hand, does account for the correlation of scope and morphosyntactic placement of SPs, but at the cost of introducing phrasal affixation. Therefore, our analysis would not be a much better alternative if phrasal affixation is introduced solely to account for these facts. But there is an abundance of proposals in recent literature as well as some fairly solid empirical arguments that some morphology has to be allowed in the syntax in some languages and therefore, that the LIH as it is stated cannot be correct for both empirical and theoretical reasons.

In what follows we present the essentials of one such theory of morphosyntactic interaction proposed in Kendall and Yoon (1986) and Yoon

(1986) in which the phrasal affixation analysis of SP scope can be naturally accomodated.

3.2 Rules in the Lexicon and Syntax

In our earlier works, we pointed to the ambiguity in the use of the terms "Morphology" and "Syntax" in current linguistic literature to refer both to the domain of appplication of these types of rules and also to the rule types or rule components (modules) of morphology and syntax. One undesirable consequence of such ambiguity is that the issue of the autonomy (modularity) of syntax and the lexicon sought under Lexicalism (Chomsky 1970 and thereafter) has come to be confounded with the operational autonomy of morphological and syntactic rules. The confusion stems from the fact that the domain of application of rules and the types of rules (or, strictly speaking, operations associated with the rules) are identified. In other words, all morphological rules are regarded as taking place in the lexicon and all rules which involve concatenation of words or other types of operations such as movement rules are considered syntactic rules. The consequence of this is that the assignment of rules to domains becomes trivial since it follows the typology of rules. This is the basic idea that is spelled out in the Lexical Integrity Hypothesis.

This is often claimed to follow from the autonomy thesis which is attributed to Chomsky's "Remarks on Nominalizations" (1970). But in "Remarks", the autonomy thesis is introduced and pursued in a slightly different way. That is, Chomsky did not seek to support the autonomy of the domains of the lexicon and syntax by identifying each with a particular type of rule or operation. He assigned a rule to a particular domain when the properties exhibited by that rule matched the independently known properties of the domains, regardless of the type of operations associated with the rules. Thus, the formation of gerunds was assigned to the syntax because of the productivity and generality of the process while that of nominalizations was assigned to the lexicon because they lacked such properties. The crucial thing to notice here is that both processes involve morphological operations. A proper construal of such a position should have led to the abandonment of the identification of domain assignment and the type of rules, but the proposal made in "Remarks" was generally understood as merely sanctioning inflectional morphology in the syntax while restricting derivational morphology to the lexicon. This has led people to subsequent, largely futile, efforts to find formal properties distinguishing inflection and derivation. The latter effort clearly illustrates the preoccupation on the part of linguists to define distinct domains by distinct types of rules. The idea that the same type of rule could be in two distinct domains seemed to ruin the autonomy of domains and therefore did not sit well with them. The search for properties differentiating inflectional and derivational morphology - which are now agreed in general to be the same type and to involve the same operations - aptly illustrates this point.

We suggested in our earlier works that the persistence of such a view was mistaken in light of the numerous counterexamples posed to the LIH and proposed reinterpreting the LIH as a constraint prohibiting the interaction of rules in the lexicon and those in the syntax but not as a principle prohibiting the co-existence of different types of rules (operations) in the

respective domains of the syntax and the lexicon. Implicit behind this proposal was the view of the lexicon and syntax as domains with distinct sets of properties and constraints. While these properties may have been difficult to identify in the early seventies, the advent of Lexical Morphology and Phonology (LPM) (Kiparsky 1982, 1983; Mohanan 1982, among others), as well as other works on the nature of the lexicon (Aronoff 1976; Jackendoff 1975; Selkirk 1982, among others) provides us with fairly well-understood properties of the Lexicon and enables us to contrast it with the known properties of syntactic rules.

One crucial difference between syntactic and lexical rules that emerges from the early works in the lexicon (Aronoff, Jackendoff, etc) is the nature of rules in the lexicon as redundancy rules. The rules of the lexicon differ from the rules of syntax in that while syntactic rules are "generative" in the sense that sentences are generated anew each time they are uttered, rules of the lexicon are "redundancy rules" which state generalizations holding among basic items already stored in the mental lexicon. Such a distinction was posited to be necessary to capture the intuition that words are stored as such in our mental lexicon, while sentences cannot be. Doubtless, there are sub-regularities holding among words stored in the mental lexicon and yet the regularity is fundamentally different from syntactic regularities. The regularities one finds in the lexicon are limited and full of exceptions. Thus, although regular plural formation in English is quite productive, it cannot be a syntactic rule because of the existence of exceptions to it.

Now it is typically the case that morphological processes are irregular and less productive than phrasal concatenation of words. Therefore, if all morphological processes lacked productivity and had exceptions, the picture of morphosyntactic interaction espoused under the LIH would hold, since all morphological rules would be redundancy rules and thus restricted to the lexicon while phrasal rules would be syntactic. Nevertheless some morphological processes are characterized by a high degree of productivity and even recursiveness. A case in point is noun incorporation and complex verb formation in polysynthetic languages. These processes are productive and recursive. If a rule is recursive, the output of that rule cannot be stored in the finite lexicon because the output is potentially infinite. Therefore, a recursive rule, be it a morphological or a phrasal rule, cannot be in the lexicon.

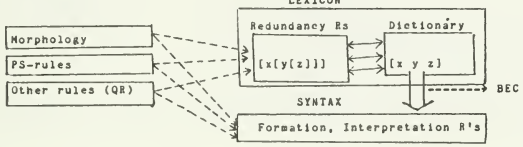
Viewed in this manner, syntax can have rules which operate in different modes, so to speak, either in terms of simple concatenation, inversion, movement, or morphological processes (cf. Dowty 1979: 294ff. for these ideas). Likewise, lexicon may contain rules which operate in terms of concatenation of words. The cases in point would be phrasal idioms (take advantage of, kick the bucket etc.) which have to be stored as units in the lexicon.

The moral that different rule types (and even the same rule) can apply in different domains is available in the model of Lexical Phonology where phonology is in fact split into two modules (domains). Cyclic (lexical) phonological rules are much like lexical redundancy rules in that they are irregular and less productive than post-lexical ones. Postcyclic phonology

is done after words are inserted in the syntax and all syntactic operations are done. Nevertheless, the same type of rules and in cases the same rule(s) appear in both modules (Kiparsky 1983). In other words, the type of rule is not identified with a domain.

What we suggested was that we do the same for rules of syntax and morphology. Understood in this way then, there is a real sense in which lexical rules (now to include not only affixation but some phrasal concatenation as well) and syntactic rules (including rules which operate in an affixing manner) do not mix, since by their very nature lexical rules list exceptions to general syntactic rules. A similar observation about phonological rules with different degrees of productivity has been termed the Elsewhere Condition (Kiparsky 1982). The idea behind the division of phonological rules into lexical vs. post-lexical also reflects this observation. Our ideas are illustrated schematically below.

(9)



Allowing rules with morphological modes of operation in the domain of syntax has, we believe, some interesting consequences for the traditional typology of languages in terms of morphological types (e.g., agglutinating vs. inflectional, etc.). It is an accepted fact that processes like Passive, Causative, Raising are found almost universally across different languages and yet they may be realized either through affixation and no change in word order, or solely through standard syntactic means, or through a combination of both. A lexicalist model of syntax would, strictly speaking, have to say that the same process takes place in one language in the syntax if it is achieved by solely syntactic means and in the lexicon in another language if the process is realized just as affixation. In practice, they avoid such undesirable consequences by the additional stipulation that all processes with lexical exceptions are lexical rules, thus making all these rules lexical. But then this additional assumption really contradicts Lexical Integrity because it means conversely that highly productive rules with no lexical exceptions are syntactic and we have been trying to show that among such rules are morphological rules in some languages, which under lexicalist assumptions, should be restricted to the lexicon. But in a framework where affixation is just another type of rule among other types of rules in the syntax, the criterion for whether are not say, Passive in one language is syntactic boils down to whether it meets the external criteria for other syntactic rules. And to the extent that Passive in a heavily agglutinative language is regular and productive, it will be a syntactic rule. This explains the traditional observation that in agglutinating languages a lot of what is syntactic is done in the morphology.

3.3. Characteristics of Syntactic (Phrasal) Affixation

In the previous section, we introduced the rationale behind a framework where the assignment of different types of rules/operations to domains is done by examining the properties exhibited by each rule rather than by looking at the operations involved in the rules. In such a framework, the question that needs to be answered is what properties characterize processes in the lexicon and those in the syntax. Therefore, in this section, we present certain properties observed to characterize phrasal syntactic processes which also are found in morphological processes we regard as syntactic.

First, syntactic, in contrast to lexical, affixation is characterized by a high degree of productivity. That productivity should play a crucial role in differentiating lexical vs. syntactic processes was already foreshadowed in the discussion of the difference between redundancy rules and generative rules in the previous section. For this reason, many have argued for a particular morphological operation to be syntactic on grounds of productivity. For example, the GB treatment of inflection (Rule R; POSS-s insertion) as syntactic reflects the fact that inflection is in general more regular and productive than derivation. The treatment of verbal compounds (synthetic compounds) as syntactic is largely due to their productivity and regularity (cf. Fabb 1984; Sugioka 1984; Sadock 1985). Most of the affixes that Sugioka considers as syntactic also exhibit a high degree of regularity unlike typical lexical affixes.

Second, phrasal affixation preserves the syntactic relations holding among the words in the phrase to which they are affixed. The primary reason for suspecting that synthetic compounds, as opposed to regular root compounds, might be syntactically constructed lies in the syntactic transparency of these compounds. For instance, if we treat the suffix -er in the synthetic compound story teller shown in (10) as being attached to the VP below, the internal syntactic structure of the VP (subcategorization, theta role assignment) is preserved in that the verb retains its subcategorization and theta assigning properties.

(10) [$_N$ [$_{VP}$story tell]]-[er]]

Sugioka argues convincingly that phrasal affixes in Japanese preserve the internal syntactic structure of the constituents they are affixed to, which is shown in (11) where the phrasal affix -tai attached to the conjoined VP does not alter the syntactic relations (Case, theta-marking) holding within the VP.

(11) JAPANESE:
Taroo-ga [$_{VP}$gohan-o tabe-te biiru-o nomi]-tai
T-SUBJ rice-OBJ eat-and beer-OBJ drink-want
'Taroo wants to eat rice and drink beer.'

In general, the reason for treating incorporation as syntactic owes to the fact that the incorporated element has "syntactic reality" (Sadock 1985), as incorporated nominals retain referential properties and can be

referred to anaphorically (see Sadock 1985; 1986) given usual assumptions about the anaphoric islandhood of lexical units.

Third, the semantics of the phrases which involve phrasal affixation is regular and is compositional since the affixes are attached to the entire phrase. Thus, in the synthetic compound discussed earlier, the agentive suffix -er refers to the agent of story-telling and not just to the agent of 'telling', an interpretation which is obtained straightforwardly if -er combines with the VP [story tell]. Similarly, in the Japanese example above, what is wanted is the 'eating of the rice and drinking of the beer'and not just 'drinking of the beer'. Truly lexical morphological processes do not exhibit this semantic transparency, as we see in (12) where the apparent "scope" of the lexical comparative affix -er does not correlate predictably with its morphosyntactic placement.

(12) [happy-er than us]

The affix in question is a lexical affix attached to the adjective, yet its "scope" seems to be over the entire AP. That compositional semantic transparency is characteristic of syntax in general should be obvious.

Fourth, a property of phrasal affixes that is noted by Sugioka is that the affixes can attach to different types of syntactic constituents (for example, to VP, S, S'). This behavior is similar to that of clitics, which also have the ability to attach to different syntactic constituents. For example, the affix -soo in Japanese is claimed to attach either to a VP or to an S.

(13) a. Bill-wa [$_{VP}$France-ni iki]-soo desu
Bill-TOP France-LOC go-appear COP
'Bill appears to soon go to France' (VP)

b. [$_{S}$Bill-wa France-ni iku]-soo desu
Bill-TOP France-LOC go-hearsay COP
'I hear that Bill will go to France' (S)

This is by no means an obvious property of syntactic rules, although the fact that a VP predicate can have either NP or PP subjects ("[$_{PP}$Under the table] is a good place to hide") or the fact that verbs may take NP or S complements may correlate with this property.

3.4. SPs as Phrasal Affixes

It is significant to note that exactly the properties discussed in 3.3 also characterize SPs, which we argue to be phrasal affixes attaching to clauses and other types of phrases.

First, their attachment is highly productive in that they can attach to a wide range of clause types.

(14) **JAPANESE:**

a. DECLARATIVE:
Kono okashi-wa amai-yo
this candy-TOP sweet-SP
'This candy is sweet (I tell you!)'

b. INTERROGATIVE:
Sonna tokoro-ni dare-ga iku-ka-yo
such place-LOC who-SUBJ go-SP(Q)-SP
'Who would go to such a place?' (U's (132))

c. IMPERATIVE:
Mati-nasai-yo
wait-formal-SP
'Wait, would you?' (U's (128))

(15) **THAI:**

a. DECLARATIVE:
chán wâa kháw maa laeaew nâ?
I say he come already SP
'I believe he has already come' (P: 114)

b. INTERROGATIVE:
(ca) pay nǎy nâ?
will go where SP
'And just where are you going?'(P: 120)

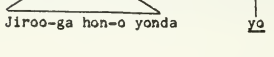
c. IMPERATIVE:
yàa phûɲ pay ɭəəy nâ?^{6}
neg just go SP SP
'Don't go just yet!' (P: 112)

Also, the affixation of SPs does not alter the internal syntactic constituency of the clause and all syntactic relations (theta marking, subcategorization, predication, etc.) are trivially preserved as the Japanese example in (16) shows.

(16) [$_{S}$Jiroo-ga [$_{V}$phon-o yonda]]-yo
Jiroo-SUBJ book-OBJ read-SP
'Jiroo read a book (I tell you).'

As we have stated at the outset, the semantics/pragmatics of the clause can be calculated compositionally if we view SPs as c-commanding the entire clause.

(17)



Finally, SPs can, as we have observed earlier, attach not only to clauses, but also to NPs, AdvPs or PPs, as the following examples illustrate.

(18) a. KOREAN:
[$_{NP}$i chʌk-+n]-yo chʌmi-iss- yo
this book-TOP-SP interesting-SP
'You know, this book is interesting.'

b. KOREAN:
K+ c^ha-ka [$_{ADVP}$pacu p'al+ke]-yo cina-kass yo
that car-SUBJ very quickly-SP pass-go-SP
'That car, you know, went by very quickly.'

c. JAPANESE:
[$_{PP}$Kansas-ni]-yo, asoko-e iki-tai-n-desu
Kansas-LOC-SP there-to go-want-nom-COP
'Ah, Kansas, there's where I want to go.'

We conclude on the basis of above evidence that SPs share enough similarities with other phrasal affixes to be treated similarly, i.e., as involving affixation to phrasal constituents.

4. ANALYZING SP SCOPE UNDER DIFFERENT FRAMEWORKS

4.1. SP Scope and Autolexical Syntax

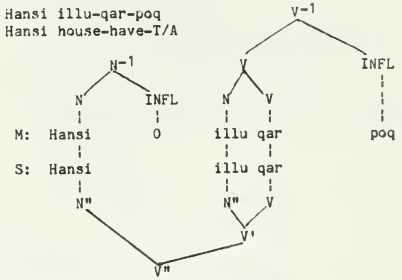
A framework which has been recently proposed that can handle the interaction between morphology and syntax in a principled way is that of Autolexical Syntax (ALS) (Sadock 1985). Unlike other models where morphology is split apart and is done both in the syntax and in the lexicon (cf. Anderson 1982 where inflectional morphology is done in the syntax; also Aronoff (1976)), ALS claims to preserve strict autonomy of the modules of morphology and syntax by assigning to an expression a dual representation of morphology and syntax and mapping between the two in a principled way. By virtue of the structure of the model, it can account for processes like cliticization where the demands of morphology[7] and syntax are in conflict, as illustrated in (18).

(19) The tall man's here

The clitic in (18) is part of the VP syntactically whereas morphologically it is an affix on the final word of the subject phrase. While earlier attempts to treat such phenomena had to break up morphology (affixation) into modules or scatter them throughout the grammar (for example, see Zwicky and Pullum (1983), who treat cliticization in a separate post-syntactic cliticization component), ALS provides a natural way of representing such a clash of morphology and syntax directly without scattering morphology into modules. Such duality is also exhibited by noun incorporation structures in Eskimo where the incorporating element is morphologically an affix on the incorporated noun, while syntactically the affix takes the noun as its complement. Incorporation has proved to be particularly stubborn to analyze in standard syntactic theories, most of which seek to retain autonomy of

morphology and syntax (and, as a byproduct, lexical integrity). An ALS analysis of noun incorporation is as follows:

(20) =Sadock's (30)

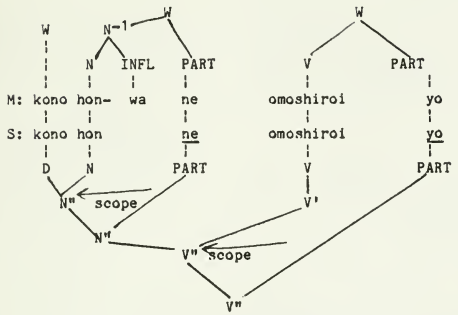


The morphological analysis of the "lexemes" (either free or bound morphemes) illu- and -qar represents them as forming a single word while the syntactic representation reflects the intuition that illu- acts as the complement of -qar. The well-formedness of the expression owes to the fact that both the syntactic and morphological requirements of -qar are met. A similar analysis can be readily found for the clitic -s in (19) (see Sadock's example (6): 385), and thus the need for a separate cliticization component vanishes. The theory can also handle the facts of inflectional morphology without having to say that it takes place in the syntax.

Inflectional morphology need not be represented in the syntactic part of the representation because the inflectional information they carry is passed on to stems and words by the familiar feature percolation principles of GPSG (the HFC and CAP) (Gazdar, Pullum, Klein & Sag 1985). That information is also passed on to the lexeme in the syntactic part of the representation by association lines and is compared with the syntactic features instantiated on syntactic terminal nodes (also by GPSG feature instantiation mechanisms). In this way, it is claimed that the strict autonomy of morphology and syntax is preserved. Incorporation even if it requires a syntactic treatment, ceases to be evidence that morphology should be broken up into smaller modules and spread throughout the grammar. Semantics in the model, an area which is directly relevant to our analysis, is assumed (without much discussion) to be restricted to the syntax, and Sadock remarks that when there is a conflict between morphological and syntactic constituency, compositional semantics will be always done on the syntactic configuration (387).

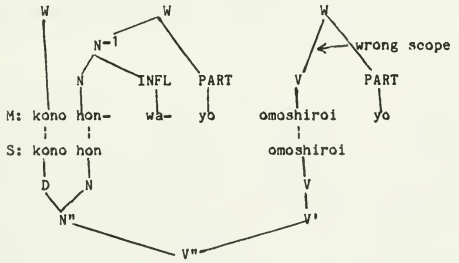
ALS can be extended as a model for SP scope if we represent SPs as affixes on verbs in the morphology and as modifying the clause in the syntax, as in the following Japanese example.

(21) [[kono hon-wa]-ne, omoshiroi]-yo
this book-TOP-SP interesting-SP
'Hey, this book is interesting (I tell you).'



The scope will then be determined by the syntactic representation, while allowing the morphological representation to capture the "wordhood" of the Verb-SP complex. Notice that if the SP is not represented in the syntax and only in the morphology as in (22) below, then we cannot obtain the correct scopal readings, even if we extend compositional semantic rules to morphology.

(22)



But since scope is considered in general to be a syntactically determined semantic property, we feel justified in giving SPs, which are scope bearing elements, a dual representation in both syntax and morphology. This extension seems natural in light of the similar treatment that Sadock gives to certain verbal affixes (see his example (55): 416) in order to ensure that the affixes have correct "scope" (over the S and over the VP

respectively) in the syntax.

Extending ALS to SP scope belies certain differences between it and the framework we adopt in this paper, which lead us to believe that ours is a more constrained account.

First, the model does not provide a clear basis for just what kind of affixes can be given a dual representation. One implicit assumption seems to be anaphoric transparency within a lexical unit, and this is illustrated by noun incorporation. Incorporated nouns are referential and can be referred to anaphorically in the syntax. Since words (including compounds) are anaphoric islands, the incorporated noun needs to be represented in the syntax where it will be a separate constituent from its affix. Another implicit criterion for giving a lexeme a dual representation seems to be where morphological constituency fails to reflect the correct syntactic constituency. This is basically a "scope" problem, and is exhibited by synthetic compound forming affixes in English, verb incorporating affixes which have sentential "scope" (Sadock's (84)) and also our analysis of SPs. According to this implicit criterion there is then no reason why inflectional affixation, which is argued to require reference to a syntactic configuration, cannot be treated in a similar fashion. In other words, the basis for syntactic relevance, precisely because it is largely assumed and not spelt out explicitly, is really vague and arbitrary. However, in the theory of syntactic affixation adopted in this paper, the question of which morphological processes are syntactic is relatively straightforward since all one needs is to look at the properties exhibited by that particular process.

A second difference between ALS and the present approach is that in order to maintain strict autonomy of morphology and syntax, ALS provides a solution to cases of mismatch between morphology and syntax by resolving the conflicts in the interface between the modules of morphology and syntax. Thus ALS maintains the traditional assumption which recognizes morphology as a domain whereas we reinterpret morphology as designating a type of rule/operation rather than a domain.

Thirdly, as pointed out to us by Jerry Morgan, ALS makes the commonly held, but by no means proven, assumption that semantic opacity (e.g. the wrong scope of SPs in morphology; lack of correlation between the surface syntactic position of quantifiers and their logical scope) has to be resolved before syntax becomes input to semantic representation so that syntactic representations need to have the relevant elements in the right "scope" for the compositional semantic rules to apply. It could be that the interface between syntax (in this case, morphosyntax) and semantics is not as trivial as the theory (or the LF representations of GB) make it out to be. In fact if the major work of the syntactic part of an ALS representation is to "fix up" logical scope obscured by the morphology, then it serves basically a filtering function for semantics, much like the role of LF in GB. Then since the compositional structure of sentences have to be interpreted anyway, these rules might be given the power to look inside word structure as well and gain the correct scopal readings (for arguments that an LF is needed for word structure, see Pesetsky (1985)). In other words, a theory with the requisite semantic interpretation rules (be they MG-like

compositional rules or Affixal QR as in Pesetsky's proposal) and a simple syntactic structure where affixes are not separate constituents is also able to handle the same facts. This last point of objection is important and seems to carry over into our analysis as well where a partial role of phrasal affixation is that of providing semantics with a transparent input. However, in our framework, not all cases of semantic opacity induced by morphology can be resolved by phrasal affixation. For instance, the comparative forming suffix -er in (12) exhibits semantic opacity but since its affixation is not productive, it cannot be analyzed as a phrasal suffix in our framework while nothing in ALS excludes treating -er as an autolexical affix, since it also exhibits "failure of hierarchiality".

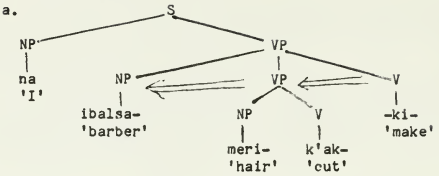
4.2. SP Scope and Marantz's Work

The model of morphosyntax proposed in Marantz (1984) for the treatment of grammatical relations in a GB-like model is appealing as a candidate for implementing our analysis of SP scope because certain grammatical function (GF) changing affixes are presented as independent syntactic constituents at one of his syntactic levels (l-s structure, s-structure, surface structure). The affixes so represented can get merged morphologically (Morphological Merger) within a structural level when required by other principles of grammar (such as Binding Theory). The merger is mediated by the properties of the lexicon. There is a principle that maps the different structural levels to one another (in a non-derivational manner) termed Principle M and this principle is loose enough to allow mappings between levels where one may level corresponds to another where the order of words and constituent structure are different. The mappings are anchored by associating lexical items across the different structural levels. In addition to these three levels, Marantz also assumes a level of Logical Form (LF) as in other varieties of GB. He assumes that l-s structure is an unordered tree where the logico-semantic relations between predicates and arguments are defined (configurationally). s-structure is also an unordered tree where syntactic relations are defined. The role of LF seems not to be different from other variants of GB theory (presumably where scope, among others, is determined).

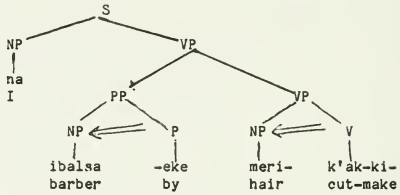
Although the above characterization of the theory may give the impression that it is wildly unconstrained, the power of the mapping principle is proven to be constrained enough to allow just the correlates of Raising, Passive, and a few other local transformations. Morphological Merger, which is claimed to take place within a level and not to map across levels, is adirectional, in that at a single level, two constituents can not only be merged (if the lexicon stores the merged form), but a logico-semantic constituent can be split up (splitting). The latter case is claimed to be exemplified by causative constructions in French. Not only is Morphological Merger (MM) triggered by lexical properties, but the kind of affixes that can be represented as separate constituents at a structural level and then be merged is highly restricted. The affixes that can undergo merger are a subset of GF-changing affixes that have their own Predicate Argument structure like regular verbs. Causative affixes in languages that have them are examples of such affixes, and Marantz (1985) shows that it is indeed plausible to regard them as having their own P-A structure on a par with verbs. The analysis of causatives and MM in his framework is exemplified below.

(23) (= Marantz's (15))

a.



b.

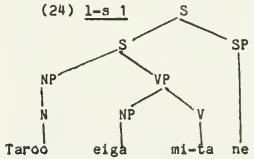


'I had my hair cut (by a barber)'

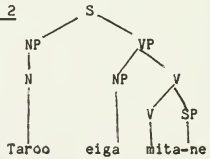
It is clear that as it stands now, his theory will not allow SPs to be broken up and represented as separate syntactic constituents. SPs are neither derivational nor GF-changing. But the idea of MM mediated by lexical properties and other principles of the grammar is attractive enough that one may wish to extend the model to cover not only the entire GF-rule syntax,[8] but to the full range of phenomena requiring a transmodular treatment (including the morphosyntactic interface) in a framework like ALS.

Assuming such an extension of the framework, we could try to account for SP scope by positing the following pair of, say, l-s structures, where the first pre-merger structure represents the SP as a separate constituent from the verb and the second l-s structure shows the post-merger structure.

(24) <u>l-s 1</u>



<u>l-s 2</u>



(= Taroo saw a movie-SP)

Scope would then have to be determined at the pre-merger l-s structure. Although it is possible to execute our analysis in this framework, there are

some reasons why we do not think this is a plausible move.

First, in keeping with assumptions generally accepted in GB, Marantz assumes scope and related phenomena to be determined at LF. But there is no merger at LF and since at LF, merger has already taken place, SP scope will have to be determined at l-s (or s-) structure, while other scopal readings (such as WH-questions) are done at LF.

Secondly, Marantz's framework as it stands is narrowly constrained with respect to what the mechanisms of the theory allow. Indeed, although the mapping principle and MM allow representations resembling a Generative Semantics style deep structure tree, the theory enforces constraints on just what elements can be represented in that manner. Extending the theory to cover a far wider range of morphosyntactic phenomena without exploring the consequences that such an extension would have for the current theory does not seem a worthwhile endeavor and we are not inclined to take that move here.

4.3 Post-syntactic Readjustment Rules

Another possible way of implementing our idea is that of phonological readjustment rules, a mechanism that is employed to account for the attachment of clitics in Zwicky (1977) and Zwicky and Pullum (1983). Readjustment rules are postsyntactic phonological rules which readjust the constituency (boundaries) assigned by the syntax and these rules have the property of ignoring major constituent breaks as defined by syntactic constituency. Therefore, if clitics are attached postsyntactically through readjustment rules amounts, they are affix-like only for the purposes of phonology and that their phonology is unrelated to morphosyntactic constituency that they enter into. Put in another way, clitics are like other independent words as far as the syntax and morphology is concerned. This seems to be a correct characterization of their properties since clitics are often reduced forms of full words.

The reason that we consider the possibility that SPs may be clitics is primarily due to Sugioka (1984) who proposes that syntactic affixes which attach to fully inflected forms (unlike the bulk of the derivational phrasal affixes she examines in her work which attach to stems) are clitics and consequently that they should be treated as being readjusted post-syntactically. Among the affixes to be treated in this manner are subordinating clausal affixes and sentence particles in Japanese. Her reasons for suspecting that they are different from typical derivational phrasal affixes are that:

i) they attach to inflected words

ii) they do not determine the category of the constituents they seem to be affixed to.

In appealing to these assumptions, she seems to be taking the position that all phrasal affixation has to be category-changing. Upon closer examination, however, there seems to be no principled reason for her assumptions. She concurs with people who view inflectional morphology to be syntactic and yet

inflectional morphology is never category-changing. Furthermore, the affixes she considers subject to readjustment show more differences than similarities when compared with clitics. Indeed, the only point of similarity is that both clitics and these affixes attach to inflected words.

The similarity ends there and goes no further. First, SPs are neither reduced forms of full words nor do they have full word counterparts. Second, unlike clitics which cannot be further affixed to, the SPs in particular can be further affixed by other SPs. One of the reasons that Zwicky and Pullum treat readjustment as postmorphosyntactic is precisely because the clitics seem to follow all processes of morphology and therefore can be analyzed as being attached in an independent module that has nothing to do with morphology proper. SPs on the other hand can be affixed to by other SPs. In fact, Thai allows a conglomeration of these particles to occur in final position as shown in the following example.

(25) diaw te? sia-leey-nii
soon kick SP SP SP
'I'm gonna kick you in a minute!' (P: 157)

Third and crucially, while clitics attach phonologically to neighboring words regardless of the constituents that they combine with syntactically and semantically (for example, the fact that the auxiliary clitic -'s in English, which is syntactically part of the VP, attaches to the end of a subject phrase), such is not the case with SPs since SPs typically appear attached to words which are syntactic heads of the phrases that they have in their scope. In this regard, SPs are parallel to other phrasal affixes like the Japanese -tai discussed earlier as well as noun incorporating affixes in Eskimo which also incorporate the head word of the syntactic phrase that they combine with.

Indeed, if SPs are attached postsyntactically via readjustment, there is no reason why their attachment should preserve semantic transparency, since presumably semantics is not relevant to phonology. True clitics, like the Latin clitic conjunction -que for example, do not show semantic transparency in their attachment. In the example below,

(26) boni pueri bellae-que puellae
good boys beautiful-CONJ girls
'Good boys and beautiful girls' (Sadock's (70))

the clitic is attached to the first word of the second conjunct, whereas semantically it conjoins the two NPs. Such lack of transparency is also exhibited in the attachment of the English auxiliary clitic -'s where the clitic which is part of the VP attaches to the subject phrase.

(27) the tall man's eating his dinner

On the basis of such evidence, we argue that the superficial similarities between clitics and SPs are illusory and that SPs (and perhaps subordinating clausal particles which behave in the same manner) are more like regular phrasal affixes. We are somewhat uncommitted as to whether the proper treatment of cliticization is via readjustment rules, but it is evident that

the SPs are sufficiently different from true clitics and enough like other phrasal affixes to be treated in the same manner. We suggest that the reasoning behind Zwicky and Pullum's treatment of clitics as involving a mismatch of phonology and syntax is basically correct and that as such, it should not be treated in a theory of morphosyntax since clitics presumably do not involve any morphology, as we and Zwicky and Pullum contend that they don't.

In sum, there seem to be some real reasons for treating cliticization and phrasal affixation differently and our proposal to treat SPs morphological operations which take phrasal units seems plausible at this point.

5. CONCLUDING REMARKS

In this paper, we made an observation concerning the correlations in the scope of SPs and their morphosyntactic placement and argued that if these are treated as phrasal affixes which combine with syntactically constructed phrases, the scopal correlations fall out as an automatic consequence of the analysis. This simple proposal led to a reexamination of the thesis of the autonomy of the lexicon and syntax spelt out in a particular manner under the Lexical Integrity Hypothesis and we suggested the outlines of a framework in which the insights of the LIH concerning the autonomy of the domains of the syntax and the lexicon are carried over but interaction of morphological and phrasal operations within a particular domain are sanctioned. We implemented our analysis of SP scope in this framework where the distinction between the domain and the type of operations involved in rules is made and where rules are assigned to domains by the properties they exhibit.

We then compared our analysis with possible alternatives under three other morphosyntactic frameworks of Autolexical Syntax, Marantz's work, and Readjustment rules and concluded by defending the plausibility and the necessity of our assumptions and our proposed framework. It remains to be determined however, whether our framework is capable of handling the bulk of cases of morphosyntactic interaction discussed in the literature and whether the apparent differences between our analysis and those of other frameworks are merely matters of execution. However, we believe that by reinterpreting Morphology as a rule type and by letting rule components have access to both the syntax and the lexicon, we have opened up yet another possible way of treating the highly intriguing, and often frustrating, interaction between morphology and syntax.

NOTES

* This paper is a revised and expanded version of a paper we presented at CLS (Kendall and Yoon 1986). We'd like to thank everyone who has made suggestions for this paper, including Jerry Morgan, Dale Russell, Dale Gerdemann, Georgia Green, Michal Livnat, Bill Crain, Michael Kenstowicz, Hyangsook Sohn, Euiyon Cho, and Jae Ohk Cho. Tsuneko Nakazawa and Namtip Pingkarawat provided Japanese and Thai data. We owe an inspirational debt of gratitude to Tom Ernst. We may regret that we have not heeded all their valuable advices. Portions of the discussions in the paper that deal with the theory of morphosyntactic interaction adopted for our analysis of SP scope are truncated versions of longer expositions in our other works and

the reader is referred in particular to Yoon (1986) for a fuller exposition of these ideas.

[1] Note that we are not claiming that in languages like Japanese, Korean and Thai there are no speech act properties that are conveyed solely pragmatically or through lexical items that can also function as non-speech act indicators. Implicature, performatives, etc. are calculated similarly to English and in many cases are determined only through contextual information. We are merely claiming that there is in addition, a class of particles that act only as indicators of speech act properties like illocutionary commitment (cf. Kendall 1987 to appear).

[2] This is not an exclusive list of languages with SPs, nor of languages with speech act particles. We have chosen these examples for expository purposes.

[3] We should mention that some SPs, like Japanese ka `question particle/or' have descriptive uses in addition to their function as attitude markers (as the translations above indicate), but these descriptive uses have different syntactic distributions from the SP uses, as (i) demonstrates.

(i) a. Kono hon wa omoshiroi desu ka?
this book TOPinteresting cop Q
`Is this book interesting?'

b. Kore wa hon ka zassi desu
this TOP book or magazine cop
`This is a book or a magazine'

So, even when there are non-speech-act modifying descriptive equivalents for some particles, we still must account for their syntactic and morphological properties when they act as SPs.

[4] Note that the Thai SPs we refer to are only those that are labeled "mood" particles by Peyasantiwong (1981). There are a number of other final particles in Thai which indicate speaker sex or speaker/hearer status (cf. (5)), but they are beyond the scope of this paper.

[5] Kendall (1985) contains a detailed criticism of the analysis of SPs as illocutionary force markers.

[6] It is possible in both Thai and Japanese to have SPs one after another, as in (c). There are many possible combinations, but describing them is beyond the scope of our investigation.

[7] It is doubtful whether clitics exhibit a conflict between the morphological and syntactic requirement. Clitics blithely attach to adjacent words and we suspect that they exhibit conflicts in phonology and syntax. More on this later.

[8] The GF-rule syntax is broader in scope than what Marantz assumes and includes not only all affix-mediated GF-changing processes but also processes that are GF-referring, such as Agreement processes which intermingle with GF-changing affixes in a predictable and important way, an aspect of grammar dubbed the Mirror Principle by Baker (1985).

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THE PHONOLOGY OF CHUKCHEE CONSONANTS*

Michael Kenstowicz

In this descriptive study the major phonological processes affecting Chukchee consonants are discussed. Chukchee is a language of the Kamchatka Peninsula in Eastern Siberia. Sources for this study include Skorik (1958,1961,1977), Moll & Inenlikej (1957), Bogoraz (1922,1937), and Zhukova (1972).

Chukchee is a language with a remarkably rich phonological structure. This paper will concentrate on one aspect of this structure--the various rules of assimilation and disssimilation affecting adjacent consonants. Special attention will be given to the ordering of these "local" consonantal rules. These rules constitute a reasonably homogeneous and rather easily segmentable portion of the entire phonology in that they follow various rules inserting and deleting vowels and are essentially unordered with the vowel harmony process. However, since some of these vocalic processes pervade many of the examples to be presented below, it is necesssary to say a few words about them here (see Kenstowicz 1979 and Krause 1979 for more detailed discussion).

Chukchee vowel harmony is of the dominant-recessive variety, with [a] and [o] dominant and [i], [e], and [u] recessive. When the recessive [i,e,u] appear in a word with a dominant vowel, they mutate to [e,a,o]. The schwa vowel undergoes no harmonic alternation and appears freely with either dominant or recessive vowels. Nevertheless, it may also appear as the only vowel of morphemes which trigger the harmonic change.

Like many languages Chukchee has rigid restrictions on the number of consonants that are permitted to cluster together in phonetic representation. There are no word-final clusters and, with the exception of [CC?], medial three-consonant clusters are prohibited as well. In addition, most initial consonant clusters are not tolerated. When such impermissible clusters arise through the concatenation of morphemes in underlying representations or through the deletion of a vowel, they are broken up by the insertion of a schwa. Initially and finally the schwa is inserted within the

cluster (i.e. #C___C and C___C#), while medially it appears at the morpheme boundary (i.e. C+___CC or CC___+C).

The inventory of Chukchee consonantal phonemes includes the voiceless stops [p,t,k,q,ʔ], the nasals [m,n,ŋ], the alveopalatal affricate [c] (with [š] allophones initially and finally), a voiced velar spirant (transcribed here as [g]), the liquids [l] (voiceless) and [r], and the glides [w] and [j].

One of the most pervasive processes in Chukchee is a rule changing voiceless stops to nasals before a nasal: [p,t,k] → [m,n,ŋ] / ___ [m,n,ŋ]. (In Chukchee's sister language Koryak only [t] undergoes this process.)

(1)	pəne-k	'to grind'	ge-mne-lin	'grinded'
	rəpən	'flesh side of hide'	rəmn-at	(plural)
	pəŋəl	'news'	ga-mŋət-len	'having news'
	təm-ək	'to kill'	ga-nma-len	'killed'
	rətən	'tooth'	rənn-at	'teeth'
	təŋe-k	'to grow'	ge-nŋe-lin	'grew'
	plek-ət	'footwear'	te-pleŋ-ŋ-ək	'to make footware'

No examples of [k] before [m] or [n] appear in (1) because of the existence of another rule which weakens [k] to the spirant [g] before a nonvelar consonant.

(2)	mək-ətənwal-ən	'having many wounds'
	mək-gərg-ən	'multitude'
	məg-pətwal-ən	'many-storied'
	məg-jən	'greater part'
	məg-cislo	'many numbered'
	məg-milger-e	'many guns'
	cek-ajəlgəw-ək	'to fear slightly'
	cig-mejŋet-ək	'to grow slightly'
	cig-nilgin-nin	'he raised slightly'
	gə-kwot-len	'took part in' (cf. kəwot-ərkən 'takes part in
	nə-gt-əqən	'hard' (cf. kət-otto-ot 'hard wood' ; also cf. nə-gtiŋ-kin 'beautiful', gatеŋ-gərg-ən 'beauty'

The most straightforward interpretation of these data would be to order the k→g rule before stop nasalization, depriving the latter of any [km] or [kn] inputs. However, the existence of another rule dissimilating [ŋ] to [g] before a nasal offers the possibility of a more roundabout way of converting [km]

and [kn] to [gm] and [gn]--namely through the intermediate stage of [ŋm] and [ŋn]. Examples of the [ŋ]→[g] / __[m,n,ŋ] rule appear in (3).

(3)

taraŋ-ək	'to build a dwelling'	na-tarag-more	'we built a dw.'
matlaŋ-en	'five'	matlag-more	'we five'
enawraŋ-ək	'to give as a gift'	enawrag-nen	'he gave it'
tejaliŋ-ək	'to press, iron'	tejalig-nin	'he pressed it'
taaroŋ-ək	'to request'	ra-taarog-ŋ-ətək	'you pl. will req.'
pət?iŋ 'cold', ŋinqej 'boy'		pət?ig-ŋinqej	'boy with a cold'

Thus, one might envisage deriving [gm] and [gn] from [km] and [kn] by first nasalizing the underlying sequences [km] and [kn] to [ŋm] and [ŋn] and then dissimilating the latter to [gm] and [gn] by the process operative in (3). However, such an analysis is precluded by the fact that underlying [kŋ] would become [ŋŋ] and then [gŋ] instead of the desired [ŋŋ]; ŋ-dissimilation applies only to underlying [ŋŋ] clusters, not to those derived from [kŋ] by stop nasalization. Thus, unless the rule of ŋ-dissimilation is endowed with the global power to distinguish those [ŋŋ] sequences which derive from [kŋ] from those that derive from [ŋŋ] (but still to apply to [ŋm] from [km] and to [ŋn] from [kn]), this analysis must be rejected.

We will thus require k→g to precede and "bleed" stop nasalization. We also require that ŋ-dissimilation precede stop nasalization since, as we have just seen, ŋ-dissimilation applies to underlying [ŋŋ] sequences but not to [ŋŋ] sequenecs that derive from [kŋ]. The following derivations illustrate the relationship among the rules in the proposed analysis.

(4)	[pn]	[kn]	[kŋ]	[ŋn]	[ŋŋ]	
	--	gn	--	--	--	k→g
	--	--	--	gn	gŋ	ŋ-dissimilation
	mn	--	ŋŋ	--	--	stop nasalization

The two sounds [ŋ] and [g] figured prominently in the above discussion. Let us now examine the behavior of these segments in other contexts. First of all, [ŋ] assimilates the point of articulation of a following consonant, while [m] and [n] do not. This is illustrated in (5).

(5)	teŋ-al?-an	'good'
	tam-wagarg-an	'good life'
	tam-pera-k	'to look good'
	tan-cotcot	'good pillow'

tan-lamŋəl	'good story'
tan-r?arqə	'good breastband'
ten-jəlqet-ək	'to sleep well'

ŋəto-k	'to go out'	ga-nto-len	'went out'
liŋəl	'pigeon'	linl-at	'pigeons'
wiŋər	'hoe'	winri-t	'hoes'
ŋəpe-k	'to get off'	ge-mpe-lin	'got off'

pimpiŋ 'ashes' (reduplication of [piŋ])

mək-	'many'	nə-mkə-kin	'often'
imət	'load'	imti-t	'loads'
nə-kim-əqin	'slow'	ge-n-kim-ew-lin	'impeded'
pera-n	'image'	ga-n-pera-w-len	'decorated'

The Chukchee nasal asssimilation process thus provides important evidence bearing on the question of nasal assimilation hierarchies. As is well known, there are many languages (e.g. Lithuanian, Arabic) where [n] assimilates the point of articulation of a following consonant while [m] does not. The Chukchee data suggest that [ŋ] is weaker than [n] in this respect. This provides further support for the generalization noted by a number of writers (e.g. Chen 1974) that velars are more likely to suffer assimilation and lenition than are dentals, which in turn are weaker than labials. The k→g process noted earlier is a further manifestation of this phenomenon since [p] and [t] do not suffer analogous weakening. (As we shall see later, Chukchee [q] also weakens before a consonant).

The behavior of the velar spirant [g] in Chukchee is quite complex. Generally before the labial consonants [m] and [p] underlying [g] appears as [w], though in some cases this change appears to be optional.

(6)

ətlag-ən	'father'	ətlaw-pojg-ən	'father's spear'
?ig-ən	'wolf'	?iw-pipiq-əlg-ən	'lemming' (wolf-mouse)
n-etleg-qin	'sweet'	etlew-mətqəmat	'honey' (sweet-fat)

ciwm-əl?-ən ≈ cigm-əl?-ən	'short'
cew-mak ≈ leg-mak	'egg shell'

In some cases underlying [k] will appear as [w] before [m] and [p], presumably through reordering of the k→g rule to feed the g→w process: *aacek* 'young man', *aacew-mətəl?-ən* 'brother-in-law'; *mək-* 'many', *məw-*

penwel 'many two-year-old reindeer bucks', *məw-mooqor* 'many pack reindeer'. The latter two forms come from Bogoraz (1922), who lists many more cases of [k] appearing as [w] before a labial than does Skorik. (Bogoraz worked with informants from the western dialect, while Skorik describes the eastern (literary) dialect.) Interestingly, in no cases have I found that [gm] from [ŋm] alternates with [wm]. Finally, there are a number of cases where [g] sporadically alternates with [w] (usually in the environment of a round vowel), but where the alternating consonant corresponds to a [w] and not to a [g] in Korjak: cf. Chukchee *wopqə* ≈ *gopqə* 'moose', Korjak *wepqə-n*; Chukchee *wut-ək* ≈ *gut-ək* 'to attach', Korjak *wut-ək*. These forms thus evidence a variable rule dissimilating [w] to [g] in the context of a rounded vowel. This rule provides an explanation for the following correspondence: Korjak *ŋəwo-k* 'to begin', Chukchee *ŋoo-k* ≈ *mgo-k*. These forms have arisen from a couple of variable rules in Chukchee phonology. One deletes intervocalic glides, converting [ŋəwo-k] to [ŋəo-k], which yields [ŋoo-k] by obligatory assimilation of schwa to an adjacent vowel. The other rule variably deletes an unstressed schwa from initial syllables giving [ŋwo-k], whence [mgo-k] by ŋ-dissimilation and [w]≈[g]. (See Skorik 1961:61-64 for discussion of these variable rules.)

Summarizing the above discussion, it seems safe to assume, with Skorik (1961:46), that there is a rule [g]→[w] /__ [labial], with a tendency to reorder this rule into a feeding relationship with the [k]→[g] rule. The other cases of [g] alternating with [w] must await further study.

Continuing the discussion of [g], it remains unchanged before coronal continuants: *ganu-k* 'to be superfluous', *ge-gnu-lin* (past tense); *gər-ək* 'to lasso', *ge-grə-lin* (past tense); *gəjulet-ək* 'to instruct', *ge-gjulet-lin* (past tense). The behavior of [g] before a velar consonant is best discussed in terms of the following matrix showing the phonology of all possible combinations of velar consonants.[1]

(7)

	k	g	w	ŋ
k	kk	kg	kw	ŋŋ
g		kg	kw	ŋŋ
w	wk	kw	kw	wŋ
ŋ	ŋk	ŋg	mw	gŋ

Examples illustrating the combinations of underlying velars depicted in (7) appear in (8).

(8) [k] + [k] ekək 'son', ekk-ət 'sons'

[k] + [g]	mək-gərg-ən 'multitude'
[k] + [w]	kəwot-ərk-ən 'takes part in', ga-kwot-len (past tense)
[k] + [ŋ]	gənnik 'animal', gənniŋ-ŋətt-ək 'to earn one's living by means of animals'
[g] + [g]	menig 'cloth', manek-gəpə 'from cloth'
[g] + [w]	wətəcg-ən 'overalls', manek-wətəcg-ən 'overalls cloth'; gəwa-k 'to be delayed', ga-kwa-len (past tense)
[g] + [ŋ]	liglig 'egg', ŋəto-k 'to go out', leŋ-ŋəto-k 'to hatch', leŋ-ŋəta-k 'to go for eggs'; ?ig-ən 'wolf', ŋinqej 'boy', ?iŋ-ŋinqej 'wolf-boy'
[w] + [k]	nə-kew-kin 'comfortable'
[w] + [g]	təw-ək 'to tell', tək-wərg-ən 'communication' from [təw-gərg-ən]; kak-wərg-ən 'comfort' from [kew-gərg-ən
[w] + [w]	ŋew-?en 'woman', wəŋe-k 'to sew', ŋak-wəŋe-gərg-ən 'woman's sewing'
[w] + [ŋ]	ənjiw 'uncle', ənjiw-ŋew 'uncle's wife'
[ŋ] + [k]	emnuŋ 'tundra', emnuŋ-kə (locative case)
[ŋ] + [g]	iŋiŋ 'nose', eŋ-gəpə 'from nose', eŋ-gərg-ən 'middle blade of reindeer horn'
[ŋ] + [w]	pimpiŋ 'ashes' (root [piŋ]), pim-wətr-ən 'flour'
[ŋ] + [ŋ]	təəroŋ-ək 'to try', rə-təərəg-ŋ-ənen 'he will try it'; nəgtiŋ-kin 'beautiful', gətig-ŋew-əcgət 'beautiful woman'

An immediate problem is presented by the data in (8)--how can [g+ŋ]→[ŋŋ] while [ŋ+ŋ]→[gŋ]? The latter change, recall, is part of a more general process that dissimilates [ŋ] before all nasal consonants (cf. (3) above). No matter in which way the rules are ordered one will always undo the effect of the other. If ŋ-dissimilation applies first, converting [ŋ+ŋ] to [gŋ], there is no way to prevent the latter from switching back to [ŋŋ] by the rule that would convert [g+ŋ] to [ŋŋ]. A similar problem arises if the rules are applied in the reverse order. Nor do these rules fall under the purview of any of the various constraints discussed in the literature for imposing disjunctive ordering.

A solution to the dilemma is suggested by the fact that a rule dissimilating the velar spirant [g] to [k] before [g] and [w] (and [k]?) is needed in any case. Suppose that this rule is extended to apply before [ŋ] as well. This move would take [gŋ] to [kŋ] and thus effectively shield this cluster from the ŋ-dissimilation rule. After the latter rule has applied to derive [gŋ] from [ŋŋ], [kŋ] from both [kŋ] and from [gŋ] will convert to [ŋŋ] by the general rule of stop nasalization. The following derivations illustrate the proposed solution.

(9)	[kŋ]	[gŋ]	[ŋŋ]	
	--	kŋ	--	g-dissimilation ([g]→[k] /__[g,w,ŋ]
	--	--	gŋ	ŋ-dissimilation
	ŋŋ	ŋŋ	--	stop nasalization

The change of [ww] and [wg] to [kw] in (8) can be handled in a variety of ways. Perhaps the most natural is [wg]→[ww]→[gw]→[kw], though I know of no evidence that would justify this particular solution.

Before proceeding to some additional rules involving Chukchee consonants it is worthwhile to note the dual nature of [w] in this language. In some cases it patterns with the labial consonants, as in the ŋ-assimilation rule of (3) and in the rule [g]→[w] / __[labial], where the change of [g] to [w] can be interpreted as an assimilation of the labiality of the following [p] and [m]. It is therefore somewhat remarkable that [w] does not trigger the latter rule. But this can be explained by the assumptiuon that all occurrences of [g+w] have already switched to [kw] by the rule of g-dissimilation, where the velar character of [w] manifests itself. Incidentally, this ordering of g-dissimilation before [g]→[w] is consistent with the principle noted in Donegan & Stampe (1979) that dissimilatory processes tend to precede assimilatory ones. I will return to this point later.

Turning now to the [q] and [ʔ] phonemes, there are two phonologically distinct kinds of glottal stop in Chukchee--a prevocalic one and a preconsonantal one. (The glottal stop does not appear word-finally.) According to Skorik (1958), these two glottal stops are distinguished phonetically in the eastern (literary) dialect. The prevocalic variety is described as "weaker" (aspiration with no complete glottal closure), while the preconsonantal one is "stronger", articulated with glottal closure. This state of affairs is historically explicable by comparison with Korjak: the prevocalic glottal stop corresponds to the Korjak pharyngeal fricative (transcribed here as [h]), while the preconsonantal one corresponds to Korjak [q].

(10)	Chukchee (eastern dialect)	Korjak	
	ʔalʔal	halhal	'snow'
	ŋewʔen	ŋewhen	'woman'
	nʔumqin	nhumqin	'wide, thick'
	laʔuk	lahuk	'to see'
	ʔaʔal-gatte	hahal	'axe'
	leʔleŋ	leqleŋ	'winter'

me?mit	maqmit	'arrows'

Most occurrences of the Chukchee preconsonantal glottal stop alternate with a prevocalic [q] and thus may be derived by the rule [q]→[ʔ] /___ C. Illustrations of this automatic alternation appear in (11).

(11)

abs.sg.	abs.pl.		
pi?piq	pi?piq-ət	'tail'	(root [piq]
ja?jaq	ja?jaq-ət	'sea gull'	(root [jaq]
aqən	a?n-ət	'fishing pole'	(root [aqn]
weqən	we?n-ət	'fish' sp.	(root [weqn]

In the western dialect of Chukchee the phonetic contrast between the prevocalic and the preconsonantal glottal stop has been lost and all occurrences of [V?C] have metathesized to [?VC].[2] Thus, in this dialect we have *meqəm*, *m?emi-t* 'arrow' corresponding to eastern *meqəm*, *me?mi-t* and to Korjak *maqəm*, *maqmi-t*. Thus, in the western dialect the distribution of the glottal from [q] parallels the distribution of the weaker glottal stop that corresponds to Korjak [h].[3]

Turning now to the coronal consonants, the table in (12) illustrates the alternations to which these consonants are subject.

(12)

	t	c	n	l	r	j
t	tt	tc	nn	tl	tr	tj
c	tt	cc	cn	tl	cr	cj
n	nt	nc	nn	nl	nr	nj
l	lt	lc	ln	tl	tr	lj
r	tt	tc	nn	tl	tr	tj
j	gt	gc	gn	gl	gr	gj

These alternations are illustrated in (13).

(13)

[c] + [t]	ətr?ec 'all, ətr?et-teg-ən 'end'
[c] + [l]	oc-ək 'to snap at', g-ot-len (past tense)
[l] + [l]	jegtel-ək 'to live', ge-jegtet-lin (past tense)
[l] + [r]	gargol 'top', gargot-ramk-ən 'upper class'
[r] + [t]	pəkir-ək 'to arrive', pəkit-tək 'you pl. arrived'
[r] + [c]	qeper 'glutton', qapat-caŋ-ən 'big glutton'
[r] + [n]	kur-ək 'to buy', kun-nin 'he bought it'
[r] + [l]	eŋer 'star', aŋat-laŋ-ən 'star'

[r] + [r]	etro-lg-an ≈ erro-lg-an 'bedding made of needles'
[r] + [j]	kur-ak 'to buy', kot-jo 'purchase'
[j] + [t]	w?ej-ak 'grass' (locative), w?eg-ti (plural)
[j] + [c]	ŋin-qej 'boy', ŋen-qag-caŋ-an 'big boy'
[j] + [n]	caj 'tea', cag-nalk-ak 'to make tea'
[j] + [l]	qej-we 'correct', qeg-lananget 'truth'
[j] + [r]	w?ej- 'grass', w?ag-ran 'grass house'
[j] + [j]	qejaqej 'nestling', qag-ja?jaq 'young sea-gull'

Thus, similar to the strengthening of [g] to [k] before velars, we find that [r] strengthens to [t] before coronals, with subsequent nasalization before [n]. In addition, [l] is strengthened to [t] before liquids and [c] assimilates the closure of following voiceless coronal consonants articulated with closure (i.e. [ct]→[tt] and [cl]→[tl]).

More interesting is the change of [j] to the velar spirant [g] before coronals. This is, admittedly, a rather peculiar phonetic change. But it is a quite regular rule, as evidenced by the behavior of Russian loanwords such as *caj* 'tea': cf. *cag-te* (plural), but *caj-paw-ak* 'to drink tea', *caj-kojŋ-an* 'tea cup'. The phonetically bizarre nature of this alternation might be mitigated by construing the change of [j] to [g] to take place in stages rather than directly. Given the phonology as a whole, it does not seem unreasonable to suppose that just as [r] is strengthened to [t] before a coronal so [j] would be strengthened to [k'], which would naturally merge with the velar [k], whence [g] by the regular rule that weakens [k] to [g] before nonvelar consonants.

In any case, whether the change of [j] to [g] is mediated by [k] or proceeds directly will not be relevant for the point that I wish to now develop. In Kenstowicz & Kisseberth (1973) it was proposed as a general ordering constraint on phonological rules that a rule of vowel epenthesis breaking up a consonant cluster will always precede and hence prevent the application of any local consonantal rule which changes the feature composition of a consonant by virtue of its adjacency to another consonant. This principle is one of the few rule-ordering universals to have withstood the test of time.[4] Chukchee phonology provides an excellent illustration of this principle since it has a rich stock of local rules. Although this point should have been apparent from the examples already cited, it will be useful to reiterate it here. Alternations like *pəne-k*, *ge-mne-lin* (root [pne]) show that schwa epenthesis bleeds stop nasalization, while alternations such as *kət-otto-ot nə-gt-aqen* show that epenthesis precedes [k]→[g]. Forms like *liŋəl*, *linl-ət* from underlying [liŋl] and [liŋl-tl] show that epenthesis precedes ŋ-assimilation. A pair of forms such as *pojg-a* 'spear (instrumental case)

but *ga-pojg-ama* (comitative case) from underlying [ga-pojg-ma] show that epenthesis bleeds the rule changing [g] to [w] before a labial. Finally, forms such as *gəwa-k*, *ga-kwa-len* (root [gwa]) and *aqən*, *a?n-ət* (root [aqn]) demonstrate that epenthesis must precede the rules of g-dissimilation and [q]→[?]. The principle that vowel epenthesis must precede any local rule correctly predicts that insertion of a schwa always prevents the application of these rules from affecting Chukchee consonants.

There is, however, an additional aspect to this principle. It predicts that if an epenthesis rule is, for any reason, sensitive to a particular feature of one of the consonants in a cluster, epenthesis will always be determined by the underlying character of the consonant, as opposed to any derived characteristic it would acquire by virtue of the application of a local rule. The Chukchee rule dissimilating [j] to [g] before a coronal provides an interesting test of this principle. As shown in Krause (1979), when word-medial epenthesis applies to break up a CCC cluster, the schwa is regularly inserted at the morpheme boundary: CC+__C or C+__CC. However, when each consonant belongs to a separate morpheme (i.e. when we have C+C+C), there is variation between whether the schwa appears between the first and second consonants or between the second and third consonants. According to Krause the principle underlying this variation is that the schwa is placed between the first and second consonants unless they share the coronal point of articulation, in which case the schwa is placed between the second and third.

The suffixal complex composed of the elements [l+ŋ] that appears in the absolute singular of many nouns will illustrate this aspect of Chukchee phonology.[5] However, first it must be pointed out that the [ŋ] of this morpheme is often disguised as surface [g] by a rule of Chukchee that converts [ŋ] to [g] after [l] and [c] (one of the few rules of Chukchee phonology affecting the second consonant in a cluster instead of the first one). The operation of this rule is apparent in the data of (14).

(14)	laŋ-ak	'to consider'	ge-lgə-lin	'considered'
	caŋat-ək	'to split'	ga-cgat-len	'split'
	ŋəl-et-ək	'to burn'	ŋəl-gəl	'smoke' (cf. Kor. ŋəlŋəl

The suffixal complex [l+ŋ] shows its underlying shape when the stem ends in a single coronal consonant, as in (15).

(15)	aŋat-l-aŋ-an	'star'	eŋer-ti	'stars'
	mran-l-aŋ-an	'mosquito'	mren-ti	'mosquitos'
	kerwa-t-l-aŋ-an	'elbow'	kirwe-t	'elbows'[6]

Note that in (15) the schwa appears between the [l] and the [ŋ] in the underlying [C+l+ŋ] cluster since the final consonant of the stem and the [l] agree in coronality.

However, when the stem ends in a noncoronal consonant the shwa appears between the stem and the [l], permitting the [ŋ] of the underlying [C+l+ŋ] cluster to become [g] by the rule illustrated in (14).

(16)	sg.	pl.	
	wanoq-əl-g-ən	wenuq-ət	'cheek'
	pepek-əl-g-ən	pipik-ət	'ankle'
	plak-əl-g-ən	plek-ət	'footware'
	jag-əl-g-ən	jeg-ət	'paw'
	teg-əl-g-ən	tig-ət	'skI'
	teŋ-əl-g-ən	tiŋ-ət	'quill pen'
	ralgət?əm-əl-g-ən	ralgət?əm-ət	'phalange'

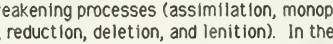
We now have a way of testing the second aspect of the proposed ordering principle. If a stem ends in [j] we have the underlying sequence [j+l+ŋ]. If the j-dissimilation rule applies before epenthesis, we derive [g+l+ŋ], which will become [g+əl+ŋ] by epenthesis and eventually [g+əl+g] (cf. in (16) [teg-l-ŋ]→ *teg-əl-g-ən*). On the other hand, if j-dissimilation is applied after epenthesis, as required by the proposed ordering principle, then schwa will be positioned between the [l] and the [ŋ] since [j] and [l] share the coronal point of articulation. Subsequent application of j-dissimilation will then yield [g+l+əŋ]. The data in (17) show that the ordering principle makes the correct prediction in this case.

(17)	stem	abs.sg.	abs.pl.	
	[epeɟ]	apaapag-l-əŋ-ən	epeepeg-ti	'spider'
		(cf. alternative abs.sg. epeepej		
	[cagiɟ]	cagag-l-əŋ-ən	cageg-ti	'sand'
		(cf. cagej-in 'sandy'		
	[w?eɟ]	w?ag-l-əŋ-ən	w?eg-ti	'grass'
		(cf. w?ej-ək 'grass' locative		
	[caɟ]	cag-l-əŋ-ən	cag-te	'tea'
		(cf. alternative abs.sg. caj		

Thus, there is a consistent contrast in the location of schwa between stems ending in an underlying [g] (cf. *teg-al-g-an* , root [tig]) versus those ending in an underlying [j] (cf. *w?ag-l-an-an* , root [w?ej])--despite the fact that the [g] - [j] opposition is itself neutralized in these forms. Interestingly, a similar contrast appears in the plural of nouns. As shown in Kenstowicz (1979) and Krause (1979) the plural affix [-ti] is subject to a special rule that deletes its vowel when the preceding stem ends in a vowel or in a noncoronal consonant. Underlying [milute-ti] 'hares' appears as *milute-t*; [wejem-ti] 'rivers' as [wejem-t] whence *wejem-at* by epenthesis; [aacek-ti] 'young men' as *aacek-at* ; but [q?awal-ti] 'corners is *q?awal-te* and [jit-ti] 'drops' is *jit-ti*. Stems ending in underlying [g] permit the vowel of the plural suffix to be lost: [menig-ti] 'cloths' appears as *menig-at* and [tig-ti] 'skis' as *tig-at* . But stems ending in underlying [j] prevent dropping of the plural vowel even though the [j] itself surfaces phonetically as [g]: [w?ej-ti] 'grasses' is *w?eg-ti* and [ejwej-ti] 'wooden forks' as *ejweg-ti*. This contrast can also be explained by the proposed ordering constraint requiring epenthesis to precede local rules. A derivation where j-dissimilation applies first and then permits the vowel of the plural suffix to be lost would involve a subsequent splitting of the dissimilated cluster by final schwa epenthesis.

In a recent paper Donegan & Stampe (1979) have suggested that the epenthesis--local rule ordering constraint can be viewed as a manifestation of a more general principle that strengthening processes (under which they include dissimilation, diphthongization, syllabication, and epenthesis) always precede weakening processes (assimilation, monophthongization, desyllabification, reduction, deletion, and lenition). In the light of the fortition-precedes-lenition principle they go on to propose a general model of phonological derivation consisting of two components.

(18) GRAMMAR



LEXICON

The underlying representation is subject to the simultaneous application of all fortition processes (with possible reapplication). The resultant output is then subject to the simultaneous application of all lenition processes (again with possible reapplication).

In general I am quite sympathetic with the approach Donegan & Stampe have taken in viewing sequencing constraints in terms of the phonetic content and intent of phonological processes. For one thing, the fortition-

characteristic rule-interaction pattern that resists an account in terms of the more cognitively based notion of rule opacity. As noted in Kenstowicz & Kisseberth (1977:175) many languages have vowel lengthening and shortening rules whose environments partially overlap. In such situations of overlapping environments a given vowel is subject to two contradictory instructions. One rule requires the vowel to be long while the other requires it to be short. Application of either one of the rules will render the other opaque. Since either ordering leads to equivalent opacity one would expect no preference for one kind of sequencing over the other. Nevertheless, in such conflicting situations the vowel is typically shortened rather than lengthened. If one makes the rather natural assumption that lengthening is a fortition process while shortening is a form of lenition then Donegan & Stampe's principle provides an interesting explanation for this phenomenon.

Nevetheless I think that it is a mistake to construe the vowel-epenthesis -precedes-local-rules constraint as a subcase of the more general fortition-precedes-lenition principle. For one thing, vowel epenthesis will bleed a local rule irregardless of whether the latter takes the form of a strengthening or a weakening process. As we have seen, the local rules of Chukchee are more or less evenly distributed between lenitions (assimilation) and fortitions (dissimilation); yet the application of both types is suspended when a consonant cluster is split by an epenthetic vowel.[7] For example, given the underlying form [ge-kejŋ-ma] 'bear' (comitative case) the model in (18) predicts the simultaneous application of both epenthesis and ŋ-dissimilation, which would yield the incorrect surface form *ga-kajg-ama* instead of the correct *ga-kajŋ-ama*. Perhaps it would be better to view vowel epenthesis not as a fortition process but rather as more of a prosodic principle responding to the exigencies of syllable structure and require it to apply fairly early in the derivation, with subsequent reapplication when necessary.

Another reason for not viewing epenthesis as a fortition process is that in some languages it must clearly follow deletion rules. For example, in many dialects of Levantine Arabic unstressed short high vowels are syncopated in open syllables. When syncope gives rise to an impermissible CCC cluster a general vowel epenthesis process is applied. If vowel epenthesis is a fortition process, however, then this sequencing of processes would be precluded by (18).

Regardless of whether vowel epenthesis is properly regarded as a strengthening process there is, in my opinion, a more disturbing aspect to the model of phonological derivation Donegan & Stampe propose--namley its

appeal to simultaneous application of processes. They correctly point out that bleeding interactions are the most serious challenge to this mode of rule application and suggest that most examples of bleeding can be accounted for in terms of the fortition-precedes-lenition principle. Be that as it may, there is at least one type of situation which empirically distinguishes between a simultaneous versus a sequential mode of rule application--deletion rules that stand in a mutually bleeding relation. An example of rules exhibiting this relation appears in Russian. One rule deletes the dental stops [t] and [d] before the past tense suffix [-l]. Thus, we have [met] 'sweep' and [ved] 'lead' appearing without the dental stop in the feminine, neuter, and plural past tense forms *me-l-a*, *me-l-o*, *me-l-i*; *ve-l-a*, *ve-l-o*, *ve-l-i*. The other rule deletes the past tense suffix [-l] in word-final position when preceded by a consonant, i.e. in the context C__#. Thus, we have *nes-l-a*, *nes-l-o*, *nes-l-i*, but *nes* from [nes-l] for the masculine form of 'carry'. The underlying form for the masculine past of 'lead' is clearly [ved-l]. If the rules are applied sequentially we derive either *ved* or *ve-l* depending on which rule of deletion is applied first. The correct output happens to be *ve-l*, showing that the deletion of a dental stop must be granted priority over deletion of the [-l]. If, however, the rules were to be applied simultaneously we would derive **ve*. Not only is **ve* incorrect, it is exceedingly bizarre. So far as I know, application of both rules in a mutually bleeding relationship is unprecedented. Yet since this is the one (and only?) kind of rule interaction that would distinguish between simultaneous and sequential application, it should call for some reconsideration of the issue.

It should be noted here that the Russian data are not being presented as a counterexample to the simultaneous application proposal of Donegan & Stampe since deletion of dental stops and loss of the final lateral consonant are phenomena limited to the past tense of Russian verbs and are thus not phonological *processes* in the sense of Donegan & Stampe. Nevertheless they represent the kinds of deletion phenomena that are found among natural phonological processees. If it can be shown that there are pairs of deletion *processes* standing in the mutual bleeding relationship that do apply simultaneously, this would constitute a strong argument in favor of the simultaneous mode of application. On the other hand, if one process must be granted priority over the other in such cases then we have a strong argument in favor of sequential application. It is my guess that the latter possibility will prove to be correct.

NOTES

*This paper was written in the fall of 1978 for a volume edited by Bernard Comrie on the languages of the Soviet Union. Unfortunately this volume has never appeared. Although the paper is theoretically outdated in certain respects the Chuckchee material is sufficiently interesting as well as virtually inaccessible to most readers so that publication in this form seemed warranted.

[1]I have been unable to find any clear cases of underlying [g] + [k], though it is clear that the morphology of the language would permit such clusters to arise freely since there are many suffixes beginning with [k]. As Skorik (1961) is quite careful to mention all phonological and phonetic alternations in Chukchee, his silence on this matter would lead one to believe that [g] + [k] undergoes no phonological change and thus appears as [gk] on the phonetic surface. The velar stop [k] would then constitute the only preconsonantal environment in which [k] contrasts with [g]. Before all other consonants this opposition is neutralized phonetically.

[2]As evidenced by a tape recording of a western dialect speaker supplied to the author by Bernard Comrie.

[3]Zhukova (1972:31) states that Korjak [h] deletes in final position, citing alternations like *hallah-ak* 'mother' loc., but *halla* abs.sg. I have been unable to find any examples of an [h] in preconsonantal position in Korjak, leading me to believe that the Chukchee phonotactic constraint limiting the "weak" glottal stop to prevocalic position reflects a similar limitation on Korjak [h] and thus is a reflex of the proto-language. If this is correct, then one can view the western dialect change of V?C to ?VC as motivated by this constraint. A similar positional limitation on the glottal stop appears in many Philippine languages where [?] is barred from preconsonantal position. It is interesting to note that when a [?C] cluster arises morphophonemically in these languages, typically by vowel syncope, the glottal stop is metathesized in the opposite direction from that in western Chukchee: i.e. CV?eCV→ CV?CV→CVC?V.

[4]The only counterexample I know of occurs in the Nootkan language Makah, as described in Jacobsen (1971), where a rule of vowel insertion must apply after the rule delabializing labialized consonants before another consonant or word-finally. This rule inserts a lengthened version of the root vowel after a monosyllabic stem when it is followed by a suffix beginning with a voiced or glottalized consonant: [diq] 'to sew' + [yak^{w}] → *diqi:yak* 'sewing machine'; [kutx] 'to drum' + [yak^{w}] → *kutx̣u:yak* 'drum'; [č'atq] 'to spoon up' + [yak^{w}] → *č'atqa:yak* 'spoon'. The rule does not affect

polysyllabic stems (cf. [we?ič] 'to sleep' + [yakʷ] → *we?ičyak* 'mattress') nor does it apply between suffixes (cf. [lic+a:s+yakʷ] → *lica:syak* 'tablecloth'). The examples cited by Jacobsen showing delabialization applying before vowel insertion are [lakʷ] 'lick' + [yakʷ] → *laka:yak* 'tongue', [q'akʷ] 'to whittle' + [yakʷ] → *q'aka:yak* 'knife' and the reduplications [lakʷ+lakʷ] 'to lick repeatedly' → *laka:lak*, [q'akʷ+q'akʷ] 'to whittle repeatedly' → *q'aka:q'ak*. Unlike Chukchee vowel epenthesis, Makah vowel insertion is a rule with no apparent phonetic intent. One might thus conclude that the proposed ordering constraint only obtains between phonological process. Nevetheless the constraint also holds for many morphologically governed processes and thus it does not seem proper to exclude them from the scope of the proposed ordering constraint.

[5]Although it is difficult to assign any definite semantic content to the [l] and the [ŋ] separately, there are nevertheless good reasons for dividing them into distinct morphological elements. Note in particular that the addition of the [l+ŋ] complex triggers the vowel harmony rule: *eŋer* 'star', *aŋat-l-aŋ-an* . This same property is exhibited by a pair of augmentative suffixes that share the [ŋ] element. [j+ŋ] has a "positive" shade of meaning and [c+ŋ] a "negative" one: *titi-t* 'needles', *tete-j-ŋ-at* 'big needles'; *tumg-at* 'comrades', *tomg-aj-ŋ-at* 'big comrades'; *kuke-t* 'kettles', *koka-c-g-at* 'big kettles'; *tiŋur-ti* 'bows', *teŋor-c-aŋ-at* 'big bows'. It thus seems reasonable to segment the [ŋ] common to all of these suffixes and endow it with the lexical property of triggering vowel harmony. Perhaps this same element is to be identified as the historic source for the vowel harmony in the dative and ablative cases: cf. Chukchee *kupre-n* 'net' (abs.sg.), *kopra-gtə* (dative), *kopra-jpə* (ablative) versus Korjak *milut* 'hare', *melota-jtaŋ* , *melota-jpaŋ*.

[6]Paired body-part words often employ the [l+ŋ] complex as a singulative: cf. *relw-al-g-an* ≈ *relw-at-l-aŋ-an* , *rilw-at* 'eyebrow'; *mang-al-g-an* ≈ *mang-at-l-aŋ-an* , *mang-at* 'hand'; *relp-al-g-an* ≈ *relp-at-l-aŋ-an* , *rilp-at* 'shoulder'.

[7]The fact that vowel epenthesis bleeds both local assimilation and dissimilation rules militates against another possible explanation for the ordering principle. If one adopts an autosegmental approach to phonology (cf. Goldsmith 1979), it is reasonable to view processes of assimilation as the spreading of an autosegment. For example, the Chukchee assimilation of [ŋ+t] to [n+t] might be viewed as the deletion of the point of articulation feature [velar] from a nasal standing before a consonant. By general

principle the point of articulation feature of the following consonant, in this case [dental], will automatically spread to the nasal, as depicted below.

We could then say that the representation [dental] forms a unit and that

vowel epenthesis may not enter inside this unit. However, such an explanation will not extend to cases where the local consonantal rule takes the form of strengthening or dissimilation, for such processes cannot be viewed as the spreading of an autosegment. If anything, they would involve the "mitosis" of an autosegment with subsequent polarization, yielding a representation which should be eligible for epenthesis.

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TONAL CHANGES: INTERPLAY BETWEEN TONE AND TONE SANDHI
A CASE STUDY OF THE SHANGHAI DIALECT*

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This paper is intended to offer a new interpretation of historical changes in tonal systems by studying old and new varieties of the Shanghai dialect of Chinese. The tonal developments in the Shanghai dialect are analyzed as the interplay between the isolation form and the sandhi form. Based on a detailed discussion of these processes, a new model of tonal changes is proposed.

1. Introduction

As noted by Hyman (1978), the study of tone changes in relation to tonological systems has lagged behind its segmental counterpart, since it is not always clear what is a plausible or phonetically motivated tonal change. However, this is an important field worth more study.

Shanghai is located on the eastern coast of China. The speech of metropolitan Shanghai belongs to the Wu Dialect, one of the seven major dialect groups in China. Within the Shanghai dialect, there are two varieties which are easily perceived by the native speaker as being different. One is spoken only by some old and middle aged people. The other is spoken by the majority of the people in Shanghai, especially by the younger generation. The former is referred to as the old variety and the latter as the new variety. The new variety is considered to be standard in metropolitan Shanghai. People who speak the old variety are often regarded as a "country cousin". The differences between the old and the new varieties in a synchronic perspective are the synchronic shadow of a diachronic development within the period from the end of the last century to the present day. This situation provides us with abundant and useful living data for the study of the nature and the processes of tonal changes. The new view on tonal development proposed in this paper is based on a careful study of the relation between the tonal systems of these two varieties.

2. Tonal systems of the old and the new varieties

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2.1 The old variety

In Chinese, generally speaking, the syllable is the smallest tone bearing unit. In the traditional analysis of the old variety of the Shanghai dialect, the syllables in isolation are assigned to six tone classes: *Yin Level, Yin Rising, Yin Departing, Yang Departing, Yin Entering, Yang Entering*. In Middle Chinese (i.e. the ancient Chinese of around the 7th century A. D.), *Level, Rising, Departing* and *Entering* were the basic tone categories. According to the properties of the syllable-initial consonants, every category was further divided into two classes: *Yin*, tones with voiceless initials; and *Yang*, tones with voiced initials. These eight classes are usually illustrated as follows:

(1)
1A Yin Level
1B Yang Level
2A Yin Rising
2B Yang Rising
3A Yin Departing
3B Yang Departing
4A Yin Entering
4B Yang Entering

Since Shanghai dialect descends from the Middle Chinese, the tones in isolation regularly correspond to the classes illustrated above. However, the syllables originally having tones of Yang Level (1B) and Yang Rising (2B) have merged into those of Yang Departing (3B).

Based on the reports of Shen (1981a, 1981b, 1982), Xu et al. (1982b), and the results of a recent investigation by the Chinese Department of Fudan University in Shanghai (Xu 1986), the phonetic values of these tonal classes are as follows:[1]

(2)

Tone	Pitch value
1A	53 or 52, noted as 53
2A	44 or 33, noted as 44
3A	34
3B	23
4A	4 or 5, short duration, noted as <u>44</u>
4B	<u>12</u> or <u>13</u>, short duration, noted as <u>13</u>

Syllables with tone 4A and tone 4B are checked syllables. Ending with a glottal stop, they are of a short duration.

Tone sandhi occurs when monosyllabic morphemes or words are combined into compound words or idiomatic phrases. Sherard (1972) calls these a "phonological word". Below is a chart of the phonetic values of the sandhi forms for bisyllabic words:

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1 In order to be commensurate with the original data source, five scale notation (with 5 highest and 1 lowest) is used here to indicate the pitch values. Pitch value is underlined when the tone is of short duration.

(3)

Second syll / First syll	1A 53	2A 44	3A 34	3B 23 1B	3B 23 2B	3B 23 3B	4A 44	4B 13
1A 53	55-53	55-31	55-31	55-53	55-31	55-31	55-53	55-53
2A 44	a. 34-53 b. 44-44	a. 34-53 b. 44-44	44-44	a. 34-53 b. 44-44	a. 34-53 b. 44-44	44-44	34-53	34-53
3A 34	a. 34-53 b. 55-31	a. 34-53 b. 55-31	55-31	a. 34-53 b. 55-31	a. 34-53 b. 55-31	55-31	34-53	34-53
3B 1B	23-44	23-44	23-44	23-44	23-44	23-44	22-55	22-55
23 2B/3B	a. 23-53 b. 22-44	a. 23-53 b. 22-44	22-44	a. 23-53 b. 22-44	a. 23-53 b. 22-44	22-44	23-53	23-53
4A 44	44-53	44-44	44-44	44-53	44-44	44-44	33-53	33-53
4B 13	11-23	11-23	11-23	11-23	11-23	11-23	22-55	22-55

Tone 1B and tone 2B are shown under the category of tone 3B, since different sandhi forms arise from the combination of syllables whose tones in isolation belonged to 1B and 2B in early time, though their isolated forms have already merged into 3B. In the chart, "a" and "b" are used to indicate the variants under same category. Form "a" is commonly used while Form "b" is used only in a few compound words

Disregarding the differences in duration, ten types of pitch values can be observed:

(4) Type
1: 55-53
2: 55-31
3: 34-53
4: 44-44
5: 23-44
6: 22-55
7: 23-53
8: 22-44
9: 33-53
10: 11-23

2.2 The new variety

In the new variety of the Shanghai dialect, there are five tones in isolation: *Yin Level* (1A), *Yin Departing* (3A), *Yang Departing* (3B), *Yin Entering* (4A) and *Yang Entering* (4B). In Contrast to the old variety, *Yin Rising* (2A) as a tone class no longer exists. Yin Rising has merged into Yin Departing (3A).

Based on the spectrographs from the author's own phonetic experiments on the tones of the new variety of Shanghai, and the reports (Xu et al. 1981, 1982a, 1983, Xu 1986), the phonetic values of these five tones are as follows:

(5)

Tone	Pitch value	Examples
1A	52 or 53, noted as 53	pin 53 'ice'
3A	34	tɕin 34 'enter'
3B	23	zu 23 'sit'
4A	4 or 5, short duration, noted as 44	hɔʔ 44 'black'
4B	12 or 13, short duration, noted as 13	hlɔʔ 13 'fall'

They are nearly identical to those in the old variety. But the sandhi forms are far simpler. Below is the chart of the phonetic values of the sandhi forms for bisyllabic words:

(6)

Second syll / First syll		1A 53	3A 34	3B 23	4A 55	4B 13
1A	53	55-31	55-31	55-31	55-31	55-31
3A	2A	33-44	33-44	33-44	33-44	33-44
34	3A	a. 33-44 b. 55-31	a. 33-44 b. 55-31	a. 33-44 b. 55-31	33-44	33-44
3B	23	22-44	22-44	22-44	22-44	22-44
4A	44	33-44	33-44	33-44	33-44	33-44
4B	13	11-23	11-23	11-23	11-23	11-23

Examples:

1A+1A	sɑ̃ 53 foŋ 53 → sɑ̃ 55 foŋ 31	'catch cold'
1A+3A	tʻɑ̃ 53 kuø 34 → tʻɑ̃ 55 kuø 31	'soup pot'
1A+3B	sɛ 53 y 23 → sɛ 55 y 31	'potato'
1A+4A	po 53 tɕiɪʔ 44 → po 55 tɕiɪʔ 31	'flatter'
1A+4B	sɛ 53 yɪʔ 13 → sɛ 55 yɪʔ 31	'March'
3A+1A	a. tsɔ 34 kɛ 53 → tsɔ 33 kɛ 44	'kitchen'
3A+1A	b. ʔi 34 sɿ 53 → ʔi 55 sɿ 31	'meaning'
3A+3A	a. tɕin 34 tsɿ 34 → tɕin 33 tsɿ 44	'scene'

3A+3A	b. sɻ 34 kɯ 34 -> sɻ 55 kɯ 31	'world'
3A+3B	a. ɸiɔ 34 nø 23 -> ɕiɔ 33 nø 44	'little girl'
3A+3B	b. tɕʻi 34 mi 23 -> tɕʻi 55 mi 31	'smell'
3A+4A	kʻuɑ 34 soʔ 44 -> kʻuɔ 33 soʔ 44	'quick'
3A+4B	kʻɑ 34 uɔʔ 13 -> kʻɑ 33 uɔʔ 44	'happy'
3B+1A	ɦu 23 tʻi 53 -> ɦu 22 tʻi 44	'staircase'
3B+3A	ɦn̩ 23 sø 34 -> ɦn̩ 22 sø 44	'five years old'
3B+3B	ɦɛ 23 dɛ 23 -> ɦɛ 22 dɛ 44	'salty egg'
3B+4A	ɦiɑ 23 soʔ 44 -> ɦiɑ 22 soʔ 44	'uncle'
3B+4B	ɦnø 23 niɪʔ 13 -> ɦnø 22 niɪʔ 44	'warm'
4A+1A	piɪʔ 44 sɛ 53 -> piɪʔ 33 sɛ 44	'beggar'
4A+3A	soʔ 44 hu 34 -> soʔ 33 hu 44	'coward'
4A+3B	sɔʔ 44 dʂ 23 -> sɔʔ 33 dʂ 44	'cork'
4A+4A	tʻɔʔ 44 tʻɔʔ 44 -> tʻɔʔ 33 tʻɔʔ 44	'put off'
4A+4B	koʔ 44 zɑʔ 13 -> koʔ 33 zɑʔ 44	'feel'
4B+1A	zɔʔ 13 tʻɤ 53 -> zɔʔ 11 tʻʂ 23	'thief'
4B+3A	bɔʔ 13 ɕiə̆ 34 -> bɔʔ 11 ɕiə̆ 23	'play'
4B+3B	zɑʔ 13 zoŋ 23 -> zɑʔ 11 zoŋ 23	'emphasis'
4B+4A	biɪʔ 13 tɕiɑʔ 44 -> biɪʔ 11 tɕiɑʔ 23	'bad quality'
4B+4B	ɦmɔʔ 13 loʔ 13 -> hmɔʔ 11 loʔ 23	'dark green'

Tone 2A is shown separately under category 3A, because different sandhi forms arise from the combination of the syllables whose tones in isolation originally belonged to 2A.

Ignoring the differences in duration, only four types of pitch values are observed:

(7)

Type I: 55-31
II: 33-44
III: 22-44
IV: 11-23

Obviously, Types I, III and IV in the new variety are the same as Types 2, 8 and 10 in the old variety.

3. Interaction between tone and tone sandhi

3.1 The most prominent characteristic of the tone sandhi of Shanghai

Comparing the sandhi forms with the isolated forms, it is not difficult to note the prominent characteristic of the relation between tone and tone sandhi in both the old and the new varieties in the Shanghai dialect. That is the contour of the first syllable in isolation dominates the contour of the whole sandhi domain.

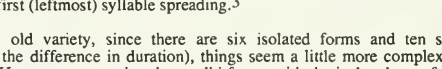
For example, in the new variety, the sandhi form of the combinations 1A-1A, 1A-3A, 1A-3B, is 55-31 (Type I). That is, it is not dependent on the tone class of the second syllable. The sandhi forms of 1A-4A and 1A-4B are the same as those above, if we ignore the difference in duration. Thus, the sandhi forms of all these five combinations can be treated as one pattern, namely 1A-X, where X represents a syllable in any of the five tone classes.

This kind of characteristic will be more obvious if we look at the spectrographs for 1A-X (see Figure 1).[2]

Sherard (1972) is the first to claim that the contour of polysyllabic words depends only on the tone of the initial syllable. Ballard (1976) stated that "in Shanghai apparently the only sandhi that occurs is of the type I shall call 'right spreading'." (p.12) This conclusion was modified by Zee and Maddieson (1979) with regard to the accurate pitch values of the first (leftmost) syllable spreading.[3]

In the old variety, since there are six isolated forms and ten sandhi types (disregarding the difference in duration), things seem a little more complex than in the new variety. However, comparing the sandhi forms with the isolated tone forms of each syllable which is a member of the combination, it is clear that in many cases the isolated form of the second syllable is irrelevant in determining the sandhi form. For example, the combinations 4B-1A, 4B-2A, 4B-3A, 4B-3B share the same sandhi type of 11-23 (Type 10). The isolated form of 4B is 13. The contour of the sandhi form with 4B as the first syllable results from spreading of the contour of 4B in isolation, as illustrated below:

(8)



Generally speaking, this most prominent characteristic of the Shanghai dialect mentioned above also prevails in the old variety. However, considering the variants of sandhi forms under the same sandhi pattern and, especially, the relation between the

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2 The experiment was carried out in the Phonetic Lab of Department of Linguistics in University of Illinois, in May, 1985, by using Digital Sona-graph 7800 and Visi-pitch 6087. The informant is a male native of Shanghai, in age of 35, who was, at that time, a visiting scholar from Shanghai, China.

3 In Zee and Maddieson (1979), detailed data of tone and tone sandhi in Shanghai based on the phonetic experiment are presented. But their data differ in several cases from what I present here. As a native speaker who was born and raised in metropolitan Shanghai, I do not think the speech of their informant can be considered as "standard metropolitan Shanghai" since this informant was in her late fifties and the acoustic data concerning the Entering tones and the related sandhi forms could not be found in any other reports.

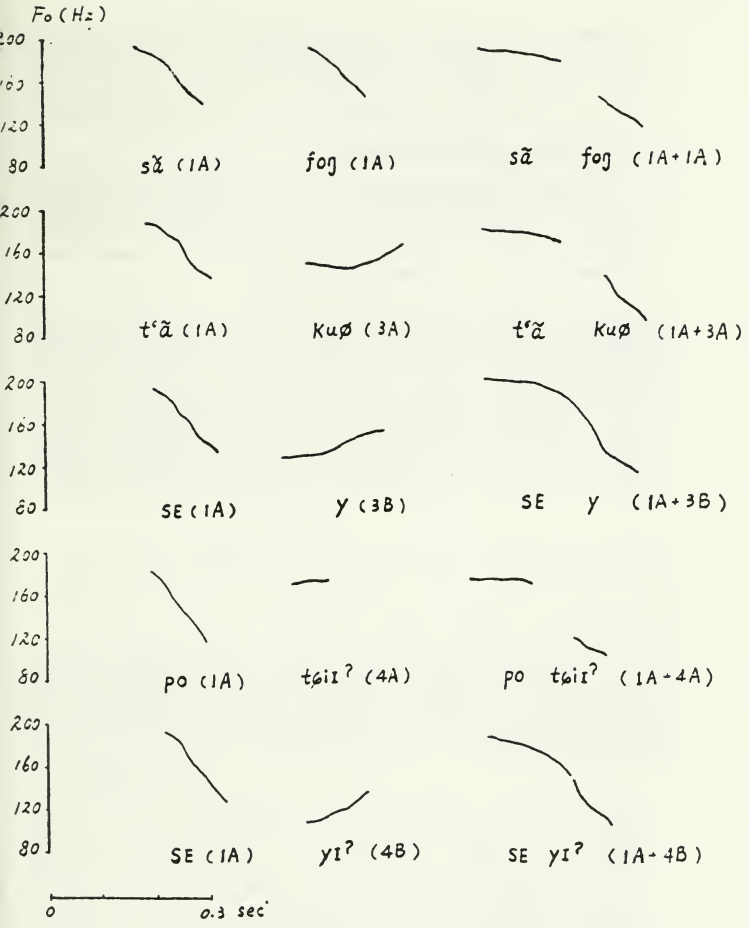

Fo (Hz)
200
160
120
80
sǎ (1A)
foŋ (1A)
sā foŋ (1A+1A)
t'ā (1A)
Kuø (3A)
t'ā Kuø (1A+3A)
SE (1A)
y (3B)
SE y (1A+3B)
po (1A)
tɕiI? (4A)
po tɕiI? (1A+4A)
SE (1A)
yI? (4B)
SE yI? (1A+4B)
0
0.3 sec

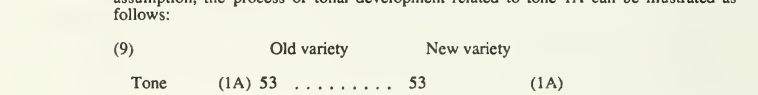
Figure 1

sandhi patterns of the two varieties, this prominent characteristic cannot give a complete interpretation of the whole picture. For instance, there are two variants, namely 44-44 and 34-53, under the category 2A in the old variety. How are they related to the isolated form 44 of their first syllable? What is the relation between these two different sandhi forms? Furthermore, how can we relate them with the sandhi form 33-44 in the new variety since 2A merged into 3B? To answer these questions, further studies are needed.

3.2 Diachronic stages in the sandhi variants

During the tonal development, some deviation of sandhi forms will happen, caused either for phonetic reasons or by some special tendency in the development of this tonal system. Therefore, the variants in synchronic perspective might reflect stages of historical development. Some represent earlier stages while others represent later stages. With this viewpoint, we can detect some traces of the tone changes of Shanghai dialect by comparing and analyzing the variants of the sandhi forms.

For example, there are two sandhi variants related to tone 1A in the old variety: 55-53 (Type 1) and 55-31 (Type 2). Since there is only 55-31 existing in the new variety, we can assume that 55-53 is an earlier form while 55-31 is a later form. 55-53 is directly derived from the isolated form 53 (tone 1A), because of the most prominent characteristic of Shanghai dialect. Then, 55-31 is derived from 55-53 as a deviation form. This deviation is caused by a special tendency of tonal change in Shanghai. In the old variety, the pitches on second syllable of the bisyllabic words in most cases are high falling if they are falling contours. In the new variety, only low falling contours occur in the same positions. So this kind of change can be viewed as the result of a special tendency which turns the contour of the high falling in second syllable into low falling. Under this assumption, the process of tonal development related to tone 1A can be illustrated as follows:



The arrow in (9) means that the sandhi form 55-53 is determined by the isolated form 53 in the old variety. Roughly speaking, the sandhi form is the "right spreading" of the isolated form of the first (leftmost) syllable. The symbol ">" indicates the historical stages reflected in these variants. 55-53 belongs to the earlier stage while 55-31 to the later stage. What related to tone 1A in the new variety is a continuity of those in the later stage of the old variety.

Let us turn to the sandhi variants related to tone 2A in the old variety. There are also two variants under the same sandhi pattern: 44-44 (Type 4) and 34-53 (Type 3). In the same way as for 1A-X, I assume that 44-44 was directly derived from tone 2A which has the pitch 44. Comparing to 44-44, 34-53, which is regarded as derived from 44-44, belongs to the later stage. The reason for such deviation can be explained by phonetic dissimilation. 44-44 is the only sandhi form consisting of two identical pitch values among the ten types of the old variety. It is not a stable one since all other forms have contours. It is reasonable to take the occurrence of 34-53 as the result of phonetic dissimilation. Thus, these two variants reflect different stages in historical development. The process of this development can be shown as below:

(10) Tone (2A) 44

Sandhi 44-44 > 34-53

With the most prominent characteristic of Shanghai dialect mentioned in 3.1 and the assumption of the diachronic stages existing in the sandhi forms, many traces of tonal development in Shanghai can be figured out. However, it is not enough to sketch out the whole picture. For instance, how can we relate the above process shown in (10) with the tone 3A and its related sandhi form 33-44 in the new variety since tone 2A has merged into the 3A of the new variety? We have to go further.

3.3 New approach: from tone sandhi to isolation tone

In traditional Chinese phonology, the tone of the isolated form of the syllable is regarded as the basic or underlying form, while the sandhi form is viewed as derived from the basic form in isolation. Thus, the isolated form is called "the original tone" while the sandhi form is called "the changed tone" in the literature of traditional Chinese phonology. Obviously, the most prominent characteristic discussed above makes sense from this perspective: isolated (basic) tone determines the (derived) sandhi form. However, in studying Chinese historical linguistics, some scholars (Ting 1982, 1986, Ho 1984) have found that the sandhi forms might be more conservative in keeping the value of the proto-tones, for which the analysis in the above section can also be taken as evidence though it is not related to the proto-tones. Thus, looking in the reverse direction, i.e. from tone sandhi to tone, has been suggested. With this new approach, some interesting facts in the Shanghai dialect can be accounted for.

The most important change in the tonal development from the old Shanghai variety to the new variety is that tone 2A merged into 3A. I have interpreted 44-44 as the result of the spreading of the isolated form 44 of the first syllable and 34-53 as an innovation by phonetic dissimilation. But, what then can be said about the relation between this sandhi form 34-53 and the sandhi form 33-44 in the new variety? How did tone 2A with a pitch value of 44 become 34 when it merged into tone 3A? Let us take the position that the sandhi form can also be viewed as the basic or underlying form and that the isolated form might be derived from the related sandhi form at some stage of tonal development. It is very interesting to note that the first part of the sandhi form 34-53 is exactly identical to the isolated form of tone 3A which is 34 in pitch value. It is systematic if we look through the whole data. Thus, I assume that the sandhi form 34-53 plays the role of the basic or underlying form for the tone 3A. The isolated form of tone 3A is derived from this portion of the sandhi form. The process of the tone change in syllables with tone 2A in the old variety merging into 3A in the new variety, can be illustrated as follows:

(11)

	Old variety		New variety	
Tone	(2A) 44		34	(3A)
Sandhi	44-44	> 34-53	33-44	

Of course, there are several stages involved in the whole process: First, the sandhi form 44-44 was derived from the isolated form 44 which acted as the basic form for it. Next, another sandhi form, 34-53, occurred as a variant of 44-44 by phonetic dissimilation. Then, the first part of the this sandhi form, 34, became the basic form for the new isolated form, 34. This resulted in the merging of 2A into 3A. Now, in the new variety, the isolated form 34 becomes the basic form, which results in the new sandhi form 33-44. Thus 33-44 replaces the variants in the old variety. With this view of the interplay between isolation tone and tone sandhi, we can work out the whole picture of the tonal developments in Shanghai.

3.4 Motivation for the new approach in Shanghai dialect

Before sketching a complete account of tonal developments in Shanghai, I present some considerations that motivate derivation of isolated form from the sandhi form.

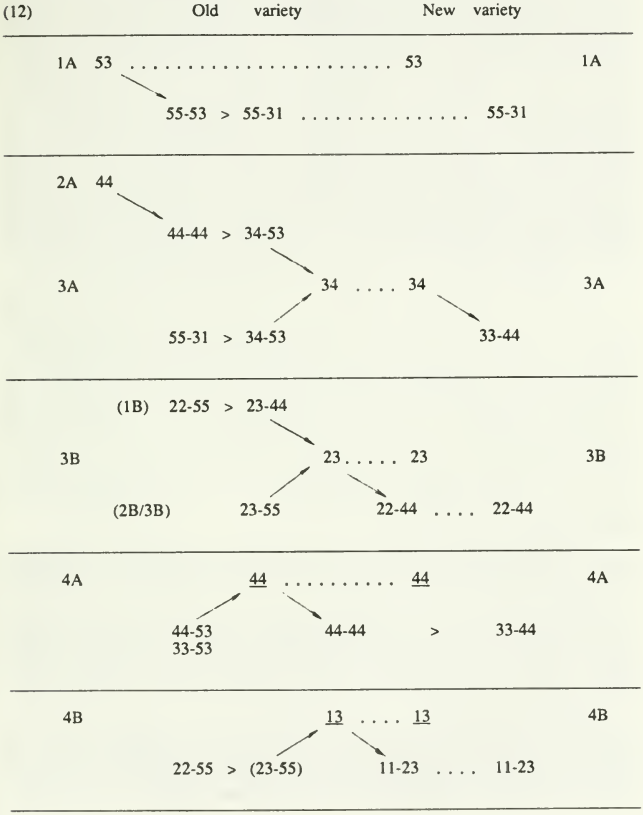
First, the fact that tone sandhi can play an important role in forming a new isolated form follows from a general tendency in the historical development of Chinese. In archaic Chinese, most of the words in the lexicon were monosyllabic. In order to differentiate homophones when the vocabulary expanded, many monosyllabic words became bisyllabic. Today, the majority of words in Modern Chinese are bisyllabic. This means that many free morphemes in ancient time are now bound morphemes. Thus, the language-learner memorizes many bisyllabic words as a complete unit instead of as separate syllables. Therefore, when a native speaker is asked for the isolated forms of certain syllables which are bound morphemes, sometimes he will be unable to tell you immediately. I have performed an experiment. I wrote down some characters which are bound morphemes and are never used independently, then asked native speakers from Shanghai to pronounce them in their own dialect. Some of them were unable to do so at once. Instead, first they spoke some bisyllabic words containing these bound morphemes. They used these bisyllabic forms to analogize or make sure of the tones on these syllables in question. Obviously, tone sandhi as the pitch of the phonological word has become more and more important in language acquisition as well as language use. In some sense, the linguistic significance of tones in the Shanghai dialect has undergone the shifting from tones of the separated syllables to the sandhi patterns of the phonological words, by which the sandhi forms have been dramatically simplified within this tonal system.

Second, that the first part of the sandhi form could be seen as the basic or underlying form in the forming of a new isolated form of certain tone class is simply the obverse of the basic principle discussed in 3.1. Since the sandhi form is dependent on the tone of the first syllable and the first syllable is always stressed in the word domain, the pitch value of the first part of the sandhi form, which is closely related to its isolated form, is more prominent than the second part. In my experiment mentioned above, when a native speaker tried to use the sandhi form to derive or check the isolated form, in most cases, he used a bisyllabic word where the tone of the syllable in question was in the first position. This fact can also be viewed as evidence for explaining why the pitch on the first syllable of the sandhi domain becomes the key in tonal change.

4. The processes of tonal changes in Shanghai dialect

4.1 The sketch of the tonal development

Based on the assumption that tonal change can be expressed in terms of the interplay between tone and tone sandhi, the whole process of tonal development in the Shanghai dialect can be sketched as follows:



4.2 More explanations for the processes of tonal changes

In this section, I give a detailed interpretation of the processes of tonal developments sketched above in (12).

Since I have discussed the processes of tonal changes under the 1A-X and 2A-X, I proceed to tone 3A directly. Under the pattern 3A-X, in the old variety there are two variants: 34-53 and 55-31. Neither of them can be explained as the result of "right spreading". But we can take both of them as historical remnants. In the tonal system of the Suzhou dialect, which also belongs to the Wu dialect and is spoken in Suzhou city, located about 60 miles away from metropolitan Shanghai, tone 3A has the pitch value 412 and under 3A-X there are two variants: one is 55-31 (or 55-21), the other is 41-34.(Yuan 1960, Ye 1979a, b, Zhang 1979, Xie 1982, Qian and Shi 1983, Ting 1986) In relation to proto Wu, Shanghai is more advanced than Suzhou, not only because the history of Shanghai is far shorter than Suzhou City but also because there were drastic sound changes in Shanghai within this century. Therefore, since Shanghai shares the same sandhi form 55-31 with Suzhou under the 3A-X, 55-31 can be viewed as a remnant of an earlier stage. Thus, 34-53 occurred later than 55-31 though we do not know the exact process of the development between them. Then, 34-53 as the basic form produced the isolated form 34 of tone 3A. In this sense, the two variants under the 3A-X already existed before the isolated form. After this isolated form took shape, the new sandhi form, 33-44 was derived in the new variety. The whole process was shown in (12).[4]

Under the 3B-X, there are three historical sources for the original tone class of the first syllable: one is descended from 1B, one from 2B, and one from 3B. As for the isolated forms, 2B merged into 3B before 1B merged with them. We can find evidence for this assumption. The tonal system in Songjiang dialect has eight isolated forms: 1A, 1B, 2A, 2B, 3A, 3B, 4A and 4B (reported in JHSFG 1960). Songjiang is located to the south of Metropolitan Shanghai and now is a county of the autonomous municipality of Shanghai. Historically, Shanghai was a small town under the administration of the Songjiang Prefecture. The tonal system in the old variety of the Xinzuang dialect has seven isolated tone forms: 1A, 1B, 2A, 3A, 3B, 4A and 4B. Xinzuang is a small town in the Shanghai County just south of Shanghai City where 2B has merged into 3B in this dialect. The differences among these geographically related dialects reflect the historical development. From Songjiang to Xinzuang, then to the old variety of Shanghai, and finally to the new variety of Shanghai, we have, in miniature, the process of simplification in the tonal system.

Since the merger of 2B and 3B occurred earlier, they share the same variants: 23-53 and 22-44. 23-53 represents an early stage while 22-44 represents a later stage since in the new variety only 22-44 survives.

For the 3B-X with the first syllable of original 1B, two variants are observed: 23-44 and 22-55. Since we find the same sandhi form 22-44 under the 1B-X in Suzhou dialect, 22-55 is assumed to represent an earlier stage while 23-44 represents a later stage. 23-44 can be considered as being derived from 22-44 by either phonetic dissimilation or "accentually induced change" (Hyman 1978).

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4 It is possible to give another interpretation for the process related to 2A-X. Since the sandhi form of the later stage under 2A-X is 34-53 which is identical to one of the variants under 3A-X, we may also assume that the merger of the sandhi forms of these two different sources happened first and then, with the new isolated form 34 was derived from this sandhi form, tone 2A merged into 3A in the new variety.

Obviously, the first part of both 23-55 and 23-44 plays the important role in forming the isolated form 23. In turn, 22-44 is derived from the isolated form 23.

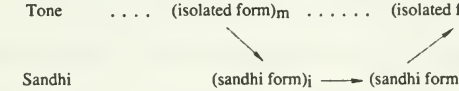
Three variants are observed under 4A-X: 44-53, 44-44 and 33-53. 33-53 exists only in the combination of two short or checked syllables, so it can be viewed as a complementary variant of 44-53 which has only one checked syllable, i.e. the first syllable. Since 44-44 is closer to the sandhi form 33-44 of the new variety, and since it can be considered as the spreading of the tone of the first syllable which has the pitch 44 or 55, it represents the late stage, while others represent the early stage. The isolated form 44 is derived from 44-53 or 33-53, and, in turn, 44-44 is derived from the isolated form 44. Since 44-44 is not stable, it becomes 33-44 in the new variety.

Under the 4B-X, there are also two variants: 11-23 and 22-55. Since Suzhou has 4B with the pitch 23 and the similar sandhi form 23-55 in contrast to 22-55 here, I assume that 22-55 is a remnant of the earlier stage. It might be earlier than Suzhou's form 23-55. 11-23 has the same form in the new variety and should be viewed as being derived from the isolated form 13. But where does this 13 come from? If sandhi form 23-55, though it no longer exists in the old variety now, is inserted between the stages represented by 22-55 and 11-23, the picture of the process may be clear: 23-55 was a deviated form of 22-55. It exerted the influence on the formation of 13, then 13 causes the occurrence of the sandhi form 11-23. Since I think such an interpretation of the process of tone change is reasonable, I put 23-55 in (12) within the paratheses as an intermediate stage between 22-55 and 11-23.

5. Conclusion: the model of tonal changes

Based on the study of the processes of tonal developments in the Shanghai dialect, a new model of tone changes is proposed, as illustrated below:

(13)



To summarize, the process of tonal changes is viewed as an interaction between the isolated form and the sandhi form. The three arrows which relate two different forms in diagram (12) may represent three different stages in tonal developments. In the first stage, tone is the determining element which serves as the basic or underlying form for the sandhi form. The sandhi form is derived from the isolated form. During the second stage, some deviations of the sandhi form occur because of different conditions or situations. A new variant is produced and may co-exist with the earlier form for a period, and then it replaces the old one. In the third stage, the new or deviated sandhi form, in turn, exerts a great influence on forming the new isolated form. It becomes the basic or underlying form for the derived isolated form as shown in the processes of tonal changes in the Shanghai dialect. These three stages constitute a cycle of spiral development.

Of course, this model does not reject the influence of other parts of sound structure over the tonal system. For example, segmental elements, such as syllable-initial consonants and syllable-final endings, also play important roles in tonal developments. It is easy to find evidence for this in the development of Chinese. However, this model,

based on the case of the Shanghai dialect, shows that the interplay between tone and tone sandhi can constitute the impetus for change within the tonal system.

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IN DEFENCE OF IMPLOSIVES

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This article demonstrates that implosives in Sindhi involve ingressive airflow, unlike the implosives in Hausa. The immediate consequence of this fact is that the proposal that there are no true implosives, i.e., those which involve suction (Ladefoged 1971) must be rejected. It also raises the question whether implosives should be characterized in phonological theory as sounds involving suction, or as sounds involving the lowering of the larynx. Comparison of the implosives in Sindhi and Kalabari with those of Hausa also demonstrates the need for including certain kinds of "phonetic implementational phenomena" in the domain of phonology.

1. Introduction

The traditional characterization of implosives is that they are (a) glottalic ingressive sounds, produced by (b) lowering the vibrating glottis (Catford 1939; Pike 1943). It is also well known that the articulation of voiced plosives (explosives) is accompanied by a lowering of the larynx which "allows a greater amount of air to pass up through the glottis before the pressure of air in the mouth has increased so much that there is insufficient difference in pressure from below to above the vocal cords to cause them to vibrate" (Ladefoged 1971:27). Given that lowering the vibrating glottis is common to voiced explosives and implosives, the crucial distinction between them centers round the direction of the airstream: explosives are egressive, produced with a supraglottal air pressure higher than that of the atmospheric pressure, while implosives are ingressive, produced with a supraglottal air pressure lower than that of the atmospheric pressure.

Ladefoged appears to think that there are no "true" implosives that meet this description, i.e., those in which the airstream is ingressive, rather than egressive. "The action of the vocal cords in the production of these implosive sounds has been one of a leaky piston..... often the piston is so leaky that the airstream is not actually ingressive nor the sounds really implosive. In many of the languages I have observed (cf. Ladefoged 1964) the pressure of the air in the mouth during an ingressive glottalic stop is approximately the same as that outside the mouth, since the rarefying action of the downward movement of the glottis is almost exactly counterbalanced by the leakage of lung air up through the vocal cords. Although these sounds may be called implosives, in ordinary conversational utterances air seldom flows into the mouth when the stop closure is released" (Ladefoged 1971: 25-26). These observations lead Ladefoged to the conclusion that "the difference between implosives and plosives is one of degree rather than of kind.... an implosive is simply a sound in which this downward movement is comparatively large and rapid" (Ladefoged 1971:27).

I shall show, using data from Sindhi, an Indo-European language spoken in Northern India, that there exist natural languages in which implosives do involve an ingressive airflow, in addition to the downward displacement of the vibrating glottis. If so, it is NOT the case that for all languages the difference between implosives and plosives is one of degree: at least in Sindhi, plosives are egressive and implosives are ingressive.

2. Instrumentation

2.1 Mingograph

An 8-channel mingograph ink writer, running at a speed of 25 cm/sec., was used to display simultaneously airflow through the mouth and nose, pitch, larynx waveforms and the audio-signal as shown below.

(1) Channel 1 - Timer
Channel 2 - Nose Intensity Filter
Channel 3 - Airflow through the nose
Channel 4 - Mouth High-Pass Filter
Channel 5 - Airflow through the Mouth
Channel 6 - Larynx Waveforms
Channel 7 - Pitch
Channel 8 - Audio Signal

2.2 Pneumotach Head

For measuring the oral and nasal airflow as electrical signals, the transducer used was the pneumotach head. This device employed a shaped hollow tube with a fine wire mesh screen across it which acts as a resistance element. (Farquharson and Anthony 1970:813). Two such transducers were used to measure separately the oral and nasal airflow. The principle of measuring airflow rate is based on the fact that the pressure drop across the resistance (the mesh screen) which is caused by an air stream, varies linearly with flow rate under certain conditions. Under these laminar-flow conditions, very precise measurements can be obtained.

Both transducers were calibrated at 396 ml/sec/2 cm. In order to obtain the volume of air displaced as a function of time, the volume velocity electrical signals are generally integrated with time. But no such attempt was made in this experiment. Instead the area was firstly worked out by applying the formula:

(2) Area = 1/2 height x base (ml/sec)

Then, volume of air in ml was obtained from the volume velocity at 396 ml/sec/2 cm. Values of the volume of air for 1 mm area will be

$$= \frac{396 \times 1 \text{ mm}}{2500} = 0.1584 \text{ ml.}$$

The pneumotach head is fitted into an anaesthetic mask and precautions were taken to ensure that it fits tightly to the subject's face. With the pneumotach head fitted tightly to the face, the subject could speak quite naturally as judged from the tape-recording.

2.3 Laryngograph

Thelaryngeal vibrations (Lx) were picked up by superficially applied electrodes placed on the skin of the neck at the thyroid cartilage. The output of the vibration pick-up was amplified in the usual way and displayed on channel 6 of the mingograph. Pitch (Fo) was not calibrated.

2.4 Audio-Signal

A dynamic microphone was used to pick up the audio-signals which were then fed through a pre-amplifier to the photographic oscillograph and displayed on the eighth channel of the mingograph. These simultaneous acoustic oscillograms helped to determine the onset and cessation of vowels and consonants.

A tape-recording of the utterances was also made to verify the identity of the word-items and for use in later experiments, if necessary.

3. Test Materials

Data on the oral and nasal airflow were collected from my own speech. The author was the sole subject for the experiment. The conclusions will, therefore, be based on my own pronunciation. Statements made are valid basically for my own idiolect, and loosely, for any/all of the other speakers of Sindhi.

Minimal pairs representing all the implosive sounds positioned syllable-initially were selected.

(3) Bilabial

[ɓaro]	(a child)
[baro]	(burden)
[ɓaɓo]	(uncle)
[babo]	(father)

Post-Alveolar/Retroflex

[mɔɗo]	(blunt, not sharp]
[mɔdo]	(duration)
[ɖɪṭho]	(seen)
[ɖɪṭho]	(obstinate)

Palatal

[mɔʄu]	(stupid)
[mɔʄo]	(pleasure)
[ʄaro]	(cobweb)
[ʄaro]	(a niche)

Velar

[gɔro]	(heavy)
[garo]	(mangy)
[bhɔgɪ]	(you broke it)
[bɔgi]	(a carriage)

All these words were uttered with a particular context of situation in mind to make them sound natural.

4 Discussion

Figure 1 gives the airflow record of the word [ɗiṭho] (seen). The closure period in the articulation of the implosive sound [ɗ] is represented by a straight line Q-C (channel 5) and A-B (channel 4) indicating no airflow in either direction through the mouth. Corresponding to this, the delimited section R-S (channel 6) of the larynx tracing clearly indicates the presence of vocal fold activity during the period of closure.

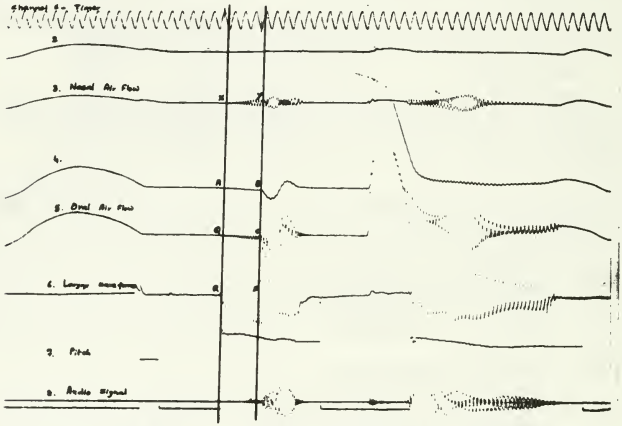

Figure 1. Kingogram of [ɗiṭho] (seen) showing the airflow record.

The downward displacement of the vibrating glottis beginning at R (corresponding to point Q, channel 5) enlarges the supraglottal cavity behind the oral closure and thus generates negative pressure in the mouth. A slight leakage of air from the lungs passing through the glottis is sufficient to produce vocal fold activity, but it does not destroy the partial vacuum produced by the larynx-lowering. Thus the rarefaction process in the expanding supraglottal cavities is not affected, so much so that the air is sucked in when the outer closure is released at point C (channel 5) and point B (channel 4). The downward deflection of the tracing below the zero line at point B (channel 4) characterizes the in-rush of the air as soon as the oral closure is released.

Two more features were noted in the production of implosives in Sindhi:

i) The mingograph records show that the duration of voicing of implosive stops is much shorter than that of the corresponding explosive stops. A comparison of implosive and explosive stops in relation to the duration of voicing was attempted. Minimal pairs representing all the implosive sounds, positioned syllable-initially, were selected and uttered with a particular context of situation on different occasions. Each word was uttered three times and the average of three measurements was taken. Table 1 presents the duration (in centiseconds) of voicing in both 'implosive' and 'explosive' stops.

Sound	Run I	Run II	Run III	Total	Average	Difference
ɓ	7	5	6	18	6	
b	12	12	11	35	11.7	5.7
ɗ̤	9	7	8	24	8	
d̤	16	16	14	46	15.3	7.3
ʄ	10	11	9	30	10	
j̤	12	12	13	37	12.3	2.3
ɠ	8	10	9	27	9	
g	11	14	14	39	13	4

Table 1: Duration of Voicing in Centiseconds

Data given in Table 1 reveal that the duration of voicing of the implosives ranges from one-half to one-eighth the duration of voicing in the corresponding explosive stops. This phenomenon of shorter duration of voicing of the implosives can be explained in aerodynamic terms. The constant transglottal airflow tends to destroy the partial vacuum in the supraglottal cavity by raising the pressure in the mouth. It is because of this aerodynamic constraint that the voicing in implosives cannot be maintained for as long a period as in the case of corresponding explosives where the inverse

relation between the voicing and supraglottal pressure can be maintained by incomplete velo-pharyngeal closure so as to help absorb the transglottal airflow. Therefore, the duration of voicing of implosive stops is much shorter than that of the corresponding explosive stops.

ii) The laryngograph records indicate the lowering of pitch and greater resonance. Figure 2 gives pitch curve obtained with the laryngograph. A sharp steep fall in the pitch beginning at point A and going upto point B may be ascribed to the downward lowering of the larynx during the closure phase of the articulation of the implosive sound [ɗ] in the word [ɗi̤tho] (seen).

Figure 3 gives the pitch curve of the word [ɖ ɪ t̤ho] (obstinate). A comparison of the two pitch curves shows that the articulation of the corresponding explosive stop [ɖ] is not characterized by such a sharp steep fall in the pitch as noted in the production of implosive [ɗ]. Greater resonance may be due to an increasingly larger cavity behind the oral closure.

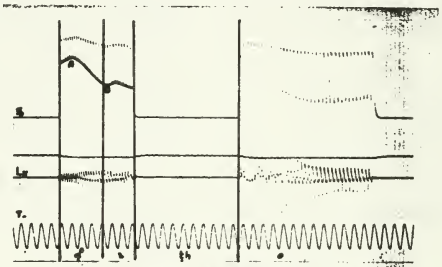

Figure 2 Micrograph of [ɗi̤tho] (seen)
Pitch Curve obtained with the laryngograph

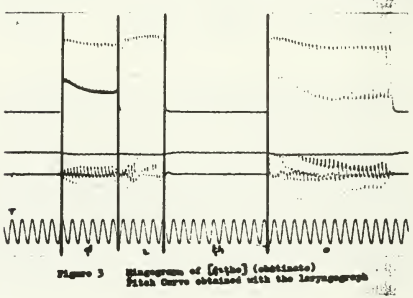

Figure 3 Micrograph of [ɖɪt̤ho] (obstinate)
Pitch Curve obtained with the laryngograph

The quantitative measurements of the air-pressure and airflow dynamics run counter to Ladefoged's assumption that there are no real implosives. The mingographic records show that the downward movement of the larynx occurs while the vocal cords are vibrating. This downward movement of the vibrating glottis enlarges the supraglottal cavity behind the closure. These vibrations are maintained by a small amount of lung air which was not of sufficient volume to destroy the partial vacuum (i.e. rarefying action) caused by the laryngeal movement and thus prevent the occurrence of pressure suction and subsequent 'ingressive' airflow. The negative pressure ranging between -3 and -7 CmH_2O was generated in the mouth. On the separation of the articulators, the airflow was found to be ingressive. The volume of air taken in ranged between 0.85 and 2.15 ml as against 6.20 and 11.67 ml thrown out for the corresponding explosives. The oral airflow records clearly indicate a very significant volume of air being sucked in at the point of release in the articulation of implosive sounds in Sindhi. These figures, of course, are precisely valid only for the specific Sindhi implosives investigated by the author.

Ladefoged seems to have lost sight of the crucial initiatory difference between the two sound-types. The implosive sounds are initiated by the downward movement of the larynx, generating negative pressure and the resulting ingressive airflow. Thus the initiation of such sounds is primarily one of glottalic suction type as opposed to one of pulmonic pressure type in the articulation of corresponding voiced explosives. It is thus the relative absence of pulmonic pressure initiatory activity in the implosive sounds in Sindhi that distinguishes implosives from voiced plosives.

5. Conclusion

The preceding discussion makes it clear that Sindhi implosives involve the suction of the air from outside, in contrast to the implosives observed by Ladefoged in which there is no such suction. The first question that comes up is: should the linguistic characterization of implosives be based on suction, the greater degree of downward displacement of the larynx being a physiological consequence of the need to maintain the pressure difference for suction, or should it simply specify (as Ladefoged implies) the greater displacement of larynx?

It seems to me that the latter choice will not explain why Sindhi implosives exhibit suction, in addition to downward displacement. The better alternative would be to have the linguistic definition include suction, and explain the absence of suction in other types of implosives in terms of the implementation of the linguistic features in terms of physiological mechanisms. This would, in some sense, be similar to the implementation of voicing in post pausal positions in English: even though linguistically specified as voiced, most of them do not exhibit voicing during the closure period.

The second question that the discussion of Sindhi implosives raises is: is the difference in suction between implosives that Ladefoged has observed and those that I have observed a general property of the languages that we are dealing with, or is it an accidental property of the individual speech habits of the speakers? Could it be the case, for example, that there are

speakers of Sindhi who produce implosives without suction, and speakers of Nigerian languages who produce it with suction? Since a sufficiently large body of data is not currently available, I leave this interesting question for future research. If it is the case that it is indeed a property of the languages (I personally subscribe to this), it is of great interest to phonological theory: what it means is that natural languages exhibit language-specific rules of "phonetic implementation" and that these must be part of the phonological description of natural languages.

It is not unlikely that the sounds of one language differ from those of another because of the phonetic value of the segments. If there is a noticeable difference between two sounds in different languages, such that either of them would sound foreign if it were used in the other language, then this difference is part of the linguistic facts of each language. The phonetic implementation of these differences is as much important as those in the sound patterns. "Both Kalabari and Hausa, languages of Nigeria, have voiced bilabial and alveolar implosives. Figure 4 shows spectrograms of words containing these sounds preceded and followed by low vowels, and

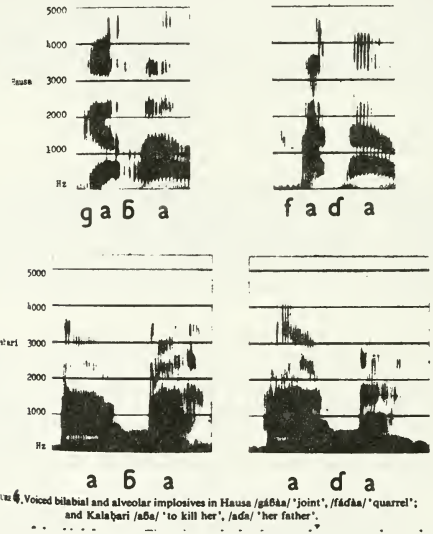

Figure 4. Voiced bilabial and alveolar implosives in Hausa /gaɓàa/ 'joint', /fàɗàa/ 'quarrel'; and Kalabari /aɓa/ 'to kill her', /aɗa/ 'her father'.

illustrates a considerable difference between the two languages. In the Hausa words, the preceding vowel is marked by irregular vibrations of the vocal cords, and there is at best laryngealized voicing throughout the closure. But in Kalabari words, the implosive sounds are fully voiced throughout the closure, and there is no tendency toward creaky voice or laryngealization" (Ladefoged 1980:500).

Figure 5 shows spectrograms of words containing these sounds in the identical environment in Sindhi. A comparison between these two sets of spectrograms clearly brings out the distinction between the implosives in Sindhi and Kalabari on the one hand, and those in Hausa on the other. Evidently, the Sindhi implosives are fully voiced throughout the period of closure and there is no tendency toward creaky or laryngealization. As a native speaker of Sindhi, I would say that Kalabari implosives, even perceptually, sound much closer to those in Sindhi. Thus there are measureable phonetic differences between languages that should be evident from full descriptions of each language. While giving a precise account of what makes a particular language sound the way it does, it is necessary to describe the phonetic properties of individual segments.

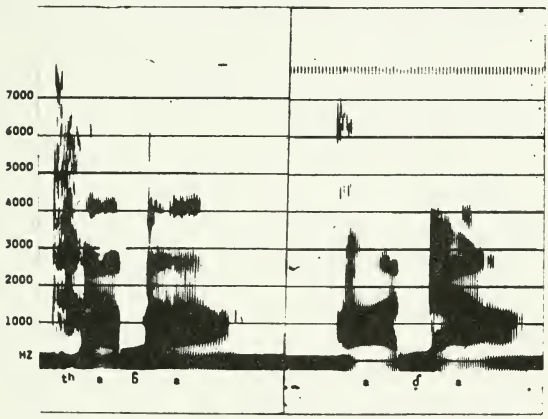

Figure 5. Voiced Bilabial and Alveolar Implosives in Sindhi
/t̪haɓa/ (jerks), /aɖa/ (crooked)

I would therefore propose that the implosives are best characterized linguistically in terms of [+/- suction] feature rather than the greater degree of downward displacement of the larynx which is just a physiological mechanism adopted in order to maintain the pressure difference for suction. The absence of suction in other types of implosives (such as Hausa and other Nigerian languages) could be explained in terms of the implementation of the linguistic features in terms of physiological mechanisms.

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SYNONYM SPLIT IN THE DIALECT OF BOSNIA AND HERCEGOVINA: A STUDY OF A CHANGE IN PROGRESS

Vesna Radanović-Kocić

This paper represents an analysis of synonym split currently taking place in the variety of the standard Serbo-Croatian which is spoken in Bosnia and Hercegovina. The fact that it is a change in progress and that it is affecting a large number of synonym pairs makes this investigation particularly promising. This paper represents a starting attempt to organize the data and to make some generalizations about the directions in which the change could develop.

1: When linguists deal with linguistic change, they usually seek answers to two questions: what causes the change and what are the mechanisms through which the change is realized. In the case of synonym split the answer to the first question seems to be clear: language simply cannot afford large numbers of synonyms, the area of meaning being infinite and the means of language finite. This is the reason why there are so few, if any, pure synonyms in language; if two expressions have the same reference, they usually differ at least in connotation or usage. The second question -- the question of mechanisms through which this semantic change is realized -- is more complex. As in other kinds of semantic change, it seems that the historical developments are unpredictable and less orderly than in any other kind of language change.

My focus in this paper will be on the mechanisms through which a particular synonym split is realized. I will investigate this semantic change in the variety of Serbo-Croatian that is spoken in Bosnia and Hercegovina. Two facts make this variety of standard Serbo-Croatian particularly interesting from the viewpoint of the mechanisms of synonym split:

(1) Synonym split is a general process affecting a wide range of lexical pairs and

(2) It is a change in progress, which always gives hope for a better understanding of the nature of a change.

The first part of the paper gives the background necessary for understanding the language situation in Bosnia and Hercegovina. The second part presents the analysis of the data. The third part summarizes the conclusions and implications of this paper's findings.

2: Standard Serbo-Croatian is usually said to be one language with two variants: Western or Croatian and Eastern or Serbian. The complex historical, ethnic, religious, and sociolinguistic reasons which lie behind this situation are not of interest here and, besides,

there exists a considerable literature on the subject.[1] The last several decades are marked by attempts on the side of Yugoslav linguists to define differences between the variants and to establish norms for each variant in the strongest possible terms.

The major linguistic differences between the variants are:

(1) Different alphabets - Latin alphabet in Western and both Cyrillic and Latin alphabets in the Eastern variant.

(2) Differences in phonology or rather in the phonetic shape of some words as the result of borrowing from different languages. Compare the following examples: OCEAN/OKEAN 'ocean' -- the first form shows traces of a Latin-German adaptation of Greek words, while the second form is more faithful to the Greek original. OPĆINA/OPŠTINA 'district' shows the Old Church Slavonic influence on eastern Serbo-Croatian, while the western form represents the native Serbo-Croatian development. In pairs like SOL/SO 'salt' the form with l reflects the influence of Kajkavian and Čakavian dialects in the west, while the form without final l shows regular Štokavian development.[3]

(3) Syntactic differences are: more frequent use of the infinitive and of indefinite adjectives in the Western than in the Eastern variant, and the position of the enclitics in the sentence (after the first accented word in Western and mainly after the first constituent in Eastern).

(4) The most prominent differences are in the lexicon, which I will discuss in the rest of the paper.

3: The most important observation is that the two lexicons only rarely differ in basic vocabulary, which is Slavic.[4] Differences are found mostly in that part of the vocabulary which includes concepts connected with modern civilization. The situation is, again, the result of many different factors.

Croats and Serbs were united in one state only in 1918, and during the long period that preceded, they lived in separate states, with very little contact and under very different cultural conditions. Croatian was heavily influenced by Latin, German, and Italian, while the Serbs borrowed from Greek, Russian, Church Slavonic, and particularly Turkish.

Most of the differences appeared in the nineteenth century. At this time the need for the development of new terminology in a vast area of knowledge was greater than ever before and that task was performed separately in two centers -- Zagreb and Belgrade or Novi Sad.

One of the strongest reasons for the lexical differences is a different attitude toward foreign words. To counter the threat of assimilation by German and Hungarian and to promote Pan-Slavic ideas, the Croats, like the Czechs, developed a very strong puristic attitude. They made constant efforts to replace borrowings from West Eauropean languages and Turkish by Slavic, especially Czech words. The Serbs were much more open toward international terminology and borrowed freely from various languages.

All these factors brought about differences between the two lexicons, which have resulted in the existence of so-called doublets -- two different words used to express the same concept, one used in the East, the other in the West.

Even though efforts to separate the variants have had only limited success, the situation in the eastern and western parts of the Serbo-Croatian territory is more or less stable. The interesting question now is the form which the standard language will take in Bosnia and Hercegovina, which occupies the central part of this territory, where the population is ethnically and linguistically mixed,[5] and where the majority of isoglosses dividing the variants meet.

4: The official standpoint with respect to the variants in Bosnia and Hercegovina is tolerance and openness to free influence from both sides. The press, mass media, educational establishment, etc. are subject to this policy, which affects doublets as well. This in practice means the appearance of large numbers of synonyms in this variety of standard Serbo-Croatian.

The starting point for my analysis was to collect data from several articles and books, the most relevant of which were: Brozović (1961), Ivić (1971), Marković (1971), Jezični savjetnik sa gramatikom, and the Mostarsko savjetovanje o književnom jeziku. The first aim was to establish as exhaustive list of doublets as possible and then to extract from that list only those doublets that appear in both forms in Bosnia and Hercegovina. I did not include in my analysis those words which are used only by members of one ethnic group. This analysis is based on my own speech, plus the speech of two additional informants. All three of us grew up in Sarajevo.

The following tables represent the results of my analysis.

5: Table 1 includes doublets which are not currently undergoing synonym split.

ABECEDA/AZBUKA	alphabet
MISA/LITURGIJA	mass, liturgy
NADBISKUP/ARHIEPISKOP	archbishop
PROCESIJA/LITIJA	procession
REDOVNIK/KALUDJER	monk
SAMOSTAN/MANASTIR	monastery
ŽUPA/PAROHIJA	parish

Table 1:1

BOCA/FLAŠA	bottle
DATULA/URMA	date (fruit)
DOJENČE/ODOJČE	suckling baby
GRAH/PASULJ	beans

HLAČE/PANTALONE	trousers
HRENOVKA/VIRŠLA	hot dog
KRUH/HLJEB	bread
LJESTVE/MERDEVINE	ladder
NAPOJNICA/BAKŠIŠ	tip, (gratuity)
NAZOR/POGLED	opinion, view
NEDOSTATAK/MANA	defect, shortcoming
NOGOMET/FUDBAL	football
UMJETNI/VJEŠTAČKI	artificial

Table 1:2

BROJKA/CIFRA	digit	DVO-,TROCIFREN	(adjective)
TAŠTINA/SUJETA	vanity	SUJETAN	vain
GNOJIVO/DJUBRIVO	fertiliser	DJUBRITI	to fertilize
KVASAC/GERMA	yeast	VINSKI KVASAC	wine dregs
NEIZBJEŽAN/ NEUMITAN	inevitable	NEUMITNA SMRT, SUDBINA	inevitable death, destiny
NEPOVREDIV/ NEPRIKOSNOVEN	untouchable, inviolable	NEPRIKOSNOVENO PRAVO	inviolable right

Table 1:3

Table 1:1 consists of pairs of words which are not synonyms in Bosnia and Hercegovina. These are mostly religious terms which in Bosnia and Hercegovina conveniently keep the distinction between the two ethnically defined religions. Even though in standard Croatian and standard Serbian the members of the pair SAMOSTAN/MANASTIR mean only 'monastery', in Bosnia and Hercegovina they mean 'Catholic monastery' and 'Orthodox monastery', respectively. Similarly, ABECEDA here meand 'Roman alphabet' while AZBUKA is used for the Cyrillic script. The unmarked term is SAMOSTAN for Croats and MANASTIR for Serbs. These pairs probably underwent synonym split at some earlier stage and that split was basically of the same nature as the present-day change. But since my main interest is the split which is currently taking place in Bosnia and Hercegovina, I exclude these data from the following discussion.

The second group (Table 1:2) represents doublets which have not undergone split, and probably never will. Usually only one of these words exists actively in any one speaker's idiom, while the other form is in the passive part of her/his vocabulary, i.e. he/she knows its meaning but does not use it. I will later come back to these examples and discuss the possible reasons for their resistance to split.

The third group (Table 1:3) contains doublets which are confined to 'basic' forms, while 'derived' forms do not appear as doublets. They are derived in this dialect from only one of the competing basic forms.

6: Table 2 shows synonyms which are currently undergoing split and therefore form the focus of this paper.

The translation on the left side shows the meaning which doublets share in the standard variants. The translation on the right side represents the meanings which the words have acquired through synonym split in Bosnia and Hercegovina.

home, house	DOM/KUĆA	house:home
liver	JETRA/DŽIGERICA	liver(organ):liver(food)
lingual, tongue (adj.)	JEZIČNI/JEZIČKI	tongue (adj.):lingual
march	KORAČNICA/MARŠ	march(song):march(way of walking)
case	KOVČEG/KOFER	coffin:suit case
abbreviation	KRATICA/SKRAĆENICA	shortcut:abbreviation
lens, lentil	LEĆA/SOČIVO	lentil:lens
beach, spa	KUPALIŠTE/BANJA	beach:spa
violet	LJUBICA/LJUBIČICA	violet(name):violet (flower)
straight	RAVNO/PRAVO	flat:straight
hour, lesson	SAT/ČAS	hour:lesson
open market	TRŽNICA/PIJACA	market:open market

Table 2:1

escape	BIJEG/BJEKSTVO	running away:escape
action	DJELOVANJE/DJEJSTVO	action:effect
crossing	KRIŽANJE/UKRŠTANJE	intersection:crossing
lowlands	NIZINA/NIZIJA	low(noun):lowlands,valley
security	OSIGURANJE/ OBEZBJEDJENJE	insurance:security
to pass	PRETEĆI/PREDUHITRITI	pass:outwit
standpoint	STAJALIŠTE/STANOVIŠTE	place for standing: standpoint, viewpoint

Table 2:2

blanket	DEKA/ĆEBE	blanket:type of blanket
hall	DVORANA/HALA	auditorium, hall: workroom in a factory
principal	GLAVNICA/KAPITAL	principal:wealth, property
dill	KOPAR/MIRODJIJA	dill:herbs
bath	KUPELJ/KUPANJE	medical bath:bath
tin	LIM/PLEH	tin:baking pen
string beans	MAHUNE/BORANIJA	leguminous vegetables: string beans
cotton	PAMUK/VATA	cotton:absorbent cotton
heel, shoe heel	PETA/ŠTIKLA	heel:shoe heel
gas	PLIN/GAS	gas for heating:gas

Table 2:3

impression	DOJAM/UTISAK	lasting:momentary impression
lonely	OSAMLJEN/USAMLJEN	lonely by one's own will: lonely
realization, cognition	SPOZNAJA/SAZNANJE	sudden realization: realization
doubt	SUMNJA/PODOZRENJE	doubt:suspicion
liquid (adj.)	TEKUĆI/TEČAN	running liquid:liquid(Adj.)
assure	UVJERITI/UBIJEDITI	convince:persuade
exterior (adj.)	VANJSKI/SPOLJAŠNJI	space:surface

Table 2:4

Jew	ŽIDOV/JEVREJ
garbage	SMEĆE/DJUBRE

Table 2:5

Examples in this table were divided into several groups according to the nature of the split.

The simplest and most straightforward way in which split is realized is represented by the examples in Table 2:1, i.e. in the case of 'total' split. It is characteristic for almost all of these words that they are polysemous in each variant, i.e. they refer to related but different concepts. For example, JETRA has two distinct references in Croatian variant -- 'liver=organ' and 'liver=food'. It is not surprising that in the dialect of Bosnia and Hercegovina the split is realized by 'dividing the job' between the two words and assigning one of the meanings to each side of the pair.

It should be noted that the majority of examples in this group are common nouns which are very close (in the way of referring) to names, i.e. they refer to concrete objects. It is interesting that the same clase of nouns also appears in Table 1:2. It seems that only in the instances of polysemy can such nouns undergo split. On the other hand, when there is no polysemy, the fact that these nouns refer to concrete objects (i.e. that there is no possibility for differentiation within the reference) prevents them from undergoing the change.

If there is no polysemy, which means no possibility to assign distinct references to two words in a pair, we find a kind of split represented by the examples in Table 2:2 and Table 2:3. The notions expressed by these words are usually of complex nature and allow several possible distinctions within themselves. The most common division is along the lines of abstract vs. concrete (cf. for example NIZINA 'low (noun)' vs. NIZIJA 'lowlands, valley' and other pairs in Table 2:2) and general vs. specific (like in a pair MAHUNE 'leguminous vegetables' vs. BORANIJA 'string beans' and other examples in Table 2:3). Unlike the case of 'total' split, many words in these groups belong to the category of verbal nouns or nouns derived from adjectives and thus are different from common

nouns and names. The complexity of concepts which they express is the source of the split in this category. The split here, then, reflects the inherent complexity of their meaning.

The fourth group of examples shows a third type of split. Here we do not deal with 'total' split or with differentiation within the same (complex) reference, but rather with a development of new meanings. The majority of doublets in this group are adjectives or verbal nouns and the new meanings that are developed in some instances have to do with the introduction of the notion of time in the meaning of the word (e.g. DOJAM/UTISAK 'lasting vs. momentary impression') or some other additional meaning (+ or - motion in the case of TEKUĆI/TEČAN 'running liquid vs. liquid (adj.); + or - agent in the case of OSAMLJEN/USAMLJEN 'lonely by one's own will vs. lonely'). One side of the pair is usually marked for this new meaning, while the other is neutral, unmarked with respect to it.

Finally, the fifth group shows split in connotation. It is also very common in languages that in a pair of synonyms one word is stylistically unmarked, and the other, for various reasons, obtains special connotation. In the two pairs which I have cited, the unmarked forms are JEVREJ and SMEĆE, while ŽIDOV has an additional pejorative meaning which is lexicalized, and DJUBRE is used almost exclusively in cursing. The stylistic potential of doublets was not of interest in this paper, but almost every word that belongs to the lexicon of one variant can have an additional stylistic marking when used by a speaker of the other variant.

7: The main question in the conclusion of this paper is: What can be predicted about synonym split as a kind of semantic change on the basis of the analysis of Serbo-Croatian data?

The first and completely expected prediction is that split will occur in all instances where the conditions for it are met, i.e. where there exists the possibility of some kind of differentiation within the reference. We have also seen that split commonly fails to take place in the case of common nouns and that their resistance to the change can be explained by their nature, i.e. by the fact that they behave like names for concrete objects.

Thus, the mechanism through which synonym split is realized is differentiation in the reference. This differentiation is carried out in four different ways:

(1) assignment of different references or 'total' split
(2) differentiation within the reference
(3) development of a new meaning
(4) difference in connotation

One other point which is related to the question of synonym split is the possibility of predicting the division between the variants with respect to these different meanings. It would be interesting to see

if there is some systematicity in choosing, for example, abstract meanings for Eastern words and concrete meanings for the forms from the Western variant. In his work on Old Church Slavonic elements in Russian, Trubetzkoy (1949) showed that Old Church Slavonic words usually have more abstract meanings than their Russian equivalents. In Serbo-Croatian, the situation is much more complicated. In the case of Russian vs. Old Church Slavonic, there is a clear sociolinguistic difference between vernacular/secular and learned/church language, and it is this difference which is reflected in the special connotations of Old Church Slavonic words in Russian. In Serbo-Croatian, however, the two variants, Serbian and Croatian, are sociolinguistic equals. There is, therefore, no 'built-in' direction for the development of special connotations.

On the other hand, it might be possible to approach this problem not in terms of the opposition between the two standard variants, but from several other points of view, such as: native vs. borrowed words, frequency of usage, the meaning of different affixes, degree of morphological transparency, etc. Such an analysis would have to include a larger number of lexemes and could not be limited to just one dialect of Serbo-Croatian. Though highly desirable, such a study would exceed the scope of this paper.

NOTES

[1]See, for example, Jonke (1965) and Ivić (1971).

[2]Whenever both forms are listed, the example on the left belongs to the Western and the example on the right to the Eastern variant.

[3]Serbo-Croatian consists of three major dialects: Štokavian, Čakavian and Kajkavian. The Štokavian dialect is the basis of the Serbo-Croatian standard language.

[4]Ivić (1971), 193.

[5]Three major ethnic groups in Bosnia and Hercegovina are: Muslims, Serbs -- traditionally Orthodox Christians, and Croats -- traditionally Roman Catholics. The differences in religions, together with historical facts, explain the cultural and linguistic differences between these three groups. For the purpose of this analysis the distinction between Croats and Serbs (cf. Table 1:1) is particularly relevant.

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DOES THE OBLIGATORY CONTOUR PRINCIPLE OPERATE IN POLISH?*

Jerzy Rubach

The purpose of this paper is to bring to attention some facts from Polish which appear to bear on the operation of the Obligatory Contour Principle (OCP). Although the evidence cannot be taken as conclusive, it seems that in general the structure of Polish can be described better if we do not evoke the OCP. The interest of the analysis is that the evidence appears to be contradictory. From one point of view the OCP seems to induce the desired effects while from the other point of view it leads to incorrect results. The structure of the paper is as follows. We begin by looking at the evidence that seems to motivate the operation of the OCP in Polish. We then pursue the consequences of our analysis for some further rules. These consequences turn out to be uniformly negative, which raises the question of whether it is correct to assume that the OCP holds for Polish.

1. Derived Imperfective Lowering

In Polish, like in other Slavic languages, verbs may appear either in the so-called perfective form or in the imperfective form. The latter denotes frequentative action. The imperfective form is derived from the perfective form by adding the suffix -aj. The phonetic representations of this suffix are [aj] before vowels and [a] before consonants since Polish has a rule of j-deletion (see Rubach 1984:92ff.).

As is well known, the imperfective suffix -aj induces some changes in the vowel of the verb root. In the framework of generative phonology, these changes have traditionally been accounted for by postulating the rule of Derived Imperfective Tensing (Laskowski 1975:74, Gussmann 1980:74). This rule has been assumed to be responsible for both the surfacing of the so-called 'yers' (high lax vowels) and for the change of //o// to [a][1]. Not to distract the reader, I will discuss the relevant facts in the appendix, where I will show that the collapsing of the rule which changes //o// to [a] with the rule which accounts for the surfacing of the yers is an overgeneralization. For the moment, I will simply assume that the alternations of [o] and [a] are governed by a rule of their own.

Consider the following data:

(1) Perfective		Derived Imperf.
u+proszcz+ą [u+prošč+oW̃] 'they will simplify'	-	u+praszcz+aj+ą 'they simplify'
o+głosz+ą [o+gwoš+oW̃] 'they will announce'	-	o+głasz+aj+ą 'they announce'
nagrodz+ą [nagroǯ+oW̃] 'they will reward'	-	nagradz+aj+ą 'they reward'
u+zbroj+ą [u+zbroj+oW̃] 'they will arm'	-	u+zbraj+aj+ą 'they arm'

The generalization is clear. Polish must have a rule which lowers /o/ to [a] in derived imperfectives. We state it informally as follows:

(2) DI Lowering o → a / — C_o aj]$_{DI}$

DI Lowering is a very productive rule. This is best shown by the fact that in recent years it has started affecting the so-called 'nasal vowels'. In spite of the efforts on the part of the normative grammarians to suppress the incoming change, it is now commonplace to find [a] in derived imperfectives such as the following:

(3)	wy+łącz+ą [vi+wonč+oW̃] 'they will switch off'	-	wy+[wanč]+aj+ą 'they switch off'
	wy+mądrz+ą [vi+mondž+oW̃] 'they will play clever'	-	wy+[mandž]+aj+ą 'they play clever'
	za+kąsz+ą [za+kõW̃š+oW̃] 'they will have a snack'	-	za+[kãW̃š]+aj+ą 'they have a snack'
	na+dąż+ą [na+dõW̃ž+oW̃] 'they will manage'	-	na+[dãW̃ž]+aj+ą 'they manage'

In terms of its status as a rule, DI Lowering would fall within the class of lexical (cyclic) rules since it refers to the grammatical information: derived imperfective.

The data analyzed so far would be of little interest if not for the fact that Polish seems to be developing a harmony process which is a complement to DI Lowering:

(4)	o+swobodz+ą 'they will liberate'	-	o+swabadz+aj+ą 'they liberate'
	u+spokoj+ą 'they will make quiet'	-	u+spakaj+aj+ą 'they make quiet'
	u+osob+ią [-b'+joW̃] 'they will personify'	-	u+asab+iaj+ą [-b'+jaj+oW̃] 'they personify'
	u+sposob+ią [-b'+joW̃] 'they will develop an attitude'	-	u+spasab+iaj+ą [-b'+jaj+oW̃] 'they develop an attitude'

Observe that both o vowels of the verb root change into [a]. This is a new development and hence it has passed unnoticed in the generative descriptions of Polish. As a fact about the pronunciation of Polish, it is not quite recognized by normative grammarians. Thus, Słownik poprawnej polszczyzny (Dictionary of Correct Polish) permits the a ... a pronunciations only in some words: o+swabadz+aj+ą 'they liberate' in our list is one such case. An informal elicitation experiment which I have conducted with a group of educated native speakers of Polish points to the fact that a ... a pronunciations are much more frequent than the Dictionary of Correct Polish would like us to believe; hence in what follows I will not be concerned with the judgements of the normative grammarians.

Let us establish the exact environment in which the left hand o in the

verb roots in (4) changes into a. There is no doubt that this change is directly connected to the fact that the right hand o has been turned into a by DI Lowering. This connection comes to light when we consider examples such as na+gromadz+ą 'they will accumulate' - na+gromadz+aj+ą 'they accumulate'. Notice that here the o of the verb root is not affected. It is clear that this is due to the fact that the capitalized A of na+gromAdz+aj+ą (DI) is not a derived segment. As shown by the perfective form na+gromAdz+ą, the A is part of the underlying representation. This is confirmed further by gromad+a 'group', the noun from which the verb na+gromadz+a+ć 'to accumulate' has been derived.

Thus we have arrived at the following generalization: //o// changes into [a] before a derived /a/. This is a classic case of a derived environment rule, as discovered originally by Kiparsky (1973) and developed further by Lexical Phonology. The rule, which we call Vowel Harmony, is stated in (5):

(5) Vowel Harmony o → a / — C_o a

Rule (5) is cyclic and hence it applies exclusively in derived environments. The a in na+gromadz+aj+ą 'they accumulate' comes directly from the underlying representation and hence it cannot function as an environment for rule (5).

Unfortunately, at a closer inspection it turns out that our rule is incorrect: Vowel Harmony does not apply in environments which are derived morphologically, that is, where the conditioning segment appears in the neighboring morpheme:

(6) kot 'cat' - kot+a (gen.sg.)
bok 'side' - bok+ami (instr.pl.)

This is very disappointing. We are forced to accept a rather uninteresting interpretation: the fact that the /a/ is derived and not underlying must be written into the formal statement of Vowel Harmony. In other words, during the derivation we must be able to distinguish between the underlying a's and the derived a's. To achieve this end, we modify DI Lowering to the extent that it now derives /ɔ/, a low round vowel:

(7) DI Lowering o → ɔ / — C_o aj]DI

Thus the mid o is turned into a low o. The phonetic output [a] is derived further by a redundancy rule which states that all low vowels in Polish are nonround.

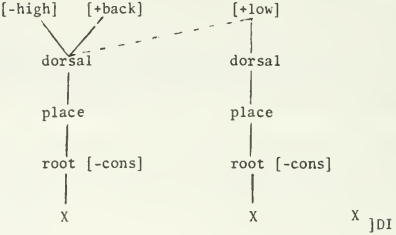
The Vowel Harmony rule is now formulated as follows:

(8) Vowel Harmony o → ɔ / — C_o ɔ

We might wish to state these rules formally. In particular, it should be made explicit that there is a phonetic relationship between the output and the environment both in DI Lowering and in Vowel Harmony. The desired effect is achieved by spreading the feature [+low]. We use the formal alphabet spelled out in Clements (1985) and in Steriade and Schein (1986), where phonetic features are grouped under nodes[3]. We assume that o is specified as round (labial) when DI Lowering applies and that consonants in Polish

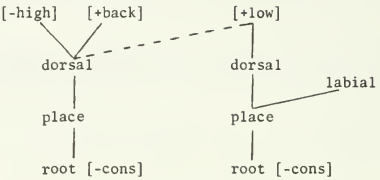
are never specified for any value of [±low]. Consequently, they are transparent to the spreading of [+low] from one vowel to another:

(9) DI Lowering



Vowel Harmony is stated as rule (10):

(10) Vowel Harmony



Given these rules the derivation of o+swabadz+aj+a 'they liberate' proceeds as in (11). Recall that o+swabadz+aj+a is the imperfective form of o+swobodz+a (see the examples in (4) above). We are looking at the portion of the derivation that contains the root and the derived imperfective suffix -aj. Note: /ʒ/ is the alveolar voiced affricate:

(11) -svoboʒ+aj-

svoboʒ+aj	DI Lowering (9)
svɔbɔʒ+aj	Vowel Harmony (10)
svabaʒ+aj	Low Vowel Redundancy: [+low] → [-lab]

Although the rules that we have postulated can correctly account for the data, the whole solution is clearly unsatisfying. Vowel Harmony is the weak link. What is particularly disturbing is the fact that the information 'derived by DI Lowering' must be encoded in the statement of the rule. The easiest way to overcome this difficulty is to assume that the change from //o// to [a] takes place in one step for both vowels. In other words, the suggestion is that the two o's should be treated as if they were one vowel. It is in this connection that we evoke the Obligatory Contour Principle (OCP).

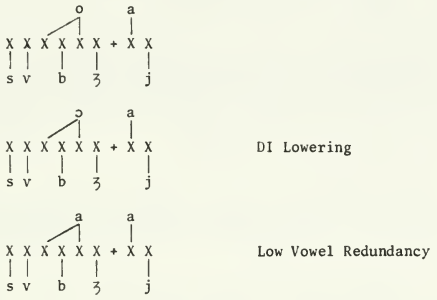
The OCP, which originally comes from Leben's (1973) treatment of tone, has been adopted for segmental phonology by McCarthy:

(12) Obligatory Contour Principle

At the melodic level, adjacent identical segments are prohibited (McCarthy 1986:208)

The function of this principle is to enforce multiple linking of neighboring identical segments. Thus, to achieve the desired effect, we only need to find a way of interpreting the two o's in (11) as adjacent. This interpretation is readily available if we assume that vowels (syllabic segments) and consonants are on separate tiers in Polish[4]. Now Vowel Harmony is no longer necessary as a rule. The derivation in (11) is replaced by that in (13):

(13)



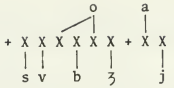
Let us recall that the full imperfective form of the word for 'liberate' is o+swabadz+aj+ą (3rd p.pl.). We observe that the o of the prefix does not change to [a]. This is a generalization. Consider the data in (14):

(14)

o+głosz+ą 'they will announce'	-	o+głasz+aj+ą 'they announce'
po+złoc+ą 'they will gild'	-	po+złac+aj+ą 'they gild'
do+sol+ą 'they will add salt'	-	do+sal+aj+ą 'they add salt'
od+now+ią [-v'+jow̃] 'they will renovate'	-	od+naw+iaj+ą [-v'+jaj+ow̃] 'they renovate'
roz+złoszcz+ą 'they will make angry'	-	roz+złaszcz+aj+ą 'they make angry'

Given McCarthy's (1986) theory of the OCP, the behavior of the prefixes is a predictable result. McCarthy assumes that each morpheme is on a separate tier. Consequently, the OCP holds only in the domain of the morpheme. This means that the o of the prefix cannot be multiply linked with the o of the verb root. The structure of o+swabadz+aj+ą 'they liberate' (DI) at the stage prior to the application of DI Lowering is thus the following:

(15)



The //o// of the prefix cannot undergo DI Lowering since it is not adjacent to the morpheme //aj//. As mentioned earlier, in this interpretation there is no rule of Vowel Harmony, hence the prefix o remains unaffected throughout the derivation. We seem to have arrived at a descriptively adequate analysis of vowel alternations in derived imperfectives.

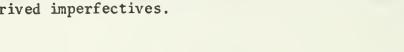
2. Implications

Recall that the success of our analysis rests upon the assumption that vowels and consonants are on separate tiers in Polish since only then the OCP can apply and the inadequate Vowel Harmony rule can be dispensed with. We will now look at the implications of this analysis and at some consequences of applying the OCP. We will consider three problem areas: palatalization, polymorphemic domains, and variability.

2.1. Palatalization

Polish has a rule of Coronal Palatalization which turns dentals into prepalatals and //r ɫ// into [ž l]. We state it informally as follows (for details, see Rubach 1984:59ff.):

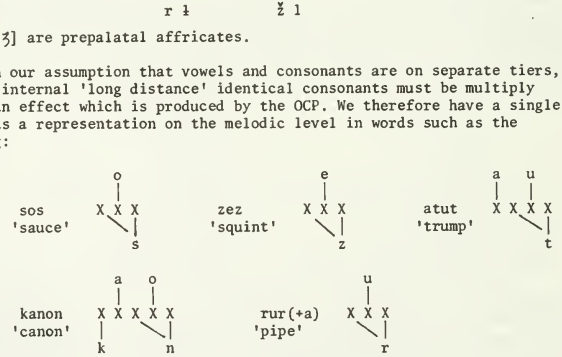
(16) Coronal Pal.



Note: [ć ʒ] are prepalatal affricates.

With our assumption that vowels and consonants are on separate tiers, morpheme-internal 'long distance' identical consonants must be multiply linked, an effect which is produced by the OCP. We therefore have a single segment as a representation on the melodic level in words such as the following:

(17)



The prediction made by these representations is that Coronal Palatalization should treat the multiply linked segments in the same manner as singly linked segments. Unfortunately, this is not the case. It is only the directly adjacent

segment that undergoes Coronal Palatalization[5]:

(18)	nom.sg.		loc.sg.: ending //e//
	sos 'sauce'	-	sos+ie [soś+e]
	zez 'squint'	-	zez+ie [zeź+e]
	atut 'trump'	-	atuc+ie[atuć+e]
	kanon 'canon'	-	kanon+ie [kanoń+e]
	rur+a 'pipe'	-	rurz+e [ruž+e]

One obvious move to make at this point is to assume that Coronal Palatalization applies after tier conflation when 'long distance' identical segments have become singly linked (see McCarthy 1986). The difficulty with this assumption is that tier conflation may take place at the end of the stratum or component but not in the middle of it (McCarthy 1986). As shown by zez+ie 'squint' (loc.sg.): //zez+e// → [zeź+e] and amply motivated in Rubach (1984), Coronal Palatalization is a cyclic rule and hence it is in the same component as DI Lowering. In sum, tier conflation cannot be evoked to solve the problem that we have encountered.

2.2. Polymorphemic domains

A different type of difficulty comes to sight when we look at the word wy+narad+aw+[j]aj+ą 'they denationalize'. It is the imperfective from wy+narod+ow+[j]ą 'they will denationalize' whose morphemic structure is motivated by the following set of forms:

(19) naród //narod// 'nation'
narod+ow+y 'national': -ow is the adjectivizing morpheme and -y is the masc. nom.sg. ending
wy+narod+ow+i+ć 'denationalize', where -i is the verbalizing morpheme, wy- is the perfective prefix and -ć is the infinitive suffix.

The input to DI Lowering is thus found in two morphemes: in the root and in the adjectivizing morpheme /narod+ov+aj/. This presents a problem since, as has already been said, the OCP has the morpheme as its domain. Consequently, the two o's cannot be multiply linked and hence the o of the root cannot undergo DI Lowering. The result is incorrect.

The words prze+poł+ow+[j]ą 'they will cut into two halves' and za+dom+ow+[j]ą 'they will make themselves at home' are entirely parallel to wy+narod+ow+[j]ą 'they will denationalize'. Both o's change to [a] in derived imperfectives: prze+pał+aw+[j]aj+ą 'they cut into two halves', za+dam+aw+[j]aj+ą 'they make themselves at home'.

2.3. Variability

The third problem area for the interpretation that proposes multiple linking is the variable nature of the data. While turning //o// into [a] before -aj in the immediately preceding syllable is uniformly obligatory for all speakers, the change of //o// into [a] in the non-neighboring syllable is often optional[6]. Thus, for many speakers, forms such as those on the right in (20) are in free variation (compare the data in (4) above):

(20) o+swobodz+ą - o+swabadz+aj+ą ~ o+swobadz+aj+ą
'they will liberate' 'they liberate'

u+spokoj+ą - u+spakaj+aj+ą ~ u+spokaj+aj+ą
'they will quiet down' 'they quiet down'

wy+narod+ow+[j]ą - wy+narad+aw+[j]aj+ą ~ wy+narod+aw+[j]aj+ą
'they will denationalize' 'they denationalize'

If we proceed on our assumption that the o's are multiply linked, then the variation in (20) cannot be explained. In fact, the prediction is made that such variation should not exist.

2.4. Single linking

The difficulties that we have encountered in this section will all disappear if we give up the earlier claim that vowels and consonants are on separate tiers in Polish. Since the relevant o's are always separated by consonants, the OCP will not be able to enforce multiple linking. Thus, the representation of o+swabadz+aj+ą 'they liberate' will be as in (21) rather than as in (13). We look at the structure: root + suffix.

(21)
```
X X X X X X + X X
| | | | | |   | |
s v o b o ʒ   a j
```

The application of Coronal Palatalization (section 2.1.) to words such as sos+ie //sos+e// 'sauce' (loc.sg.) will not be a problem since the two s's will be singly linked. The lack of multiple linking in wy+narad+aw+[j]aj+ą 'they denationalize' (section 2.2.) will not lead to any difficulties because Vowel Harmony (which then becomes necessary as a rule) can complement the changes induced by DI Lowering. The variation described in 2.3. can receive a simple explanation: Vowel Harmony is becoming established as a rule and hence in the transition period it still has a number of exceptions. Since each of the two a's in u+spokoj+ą 'they will quiet down' - u+spakaj+aj+ą (DI) is derived by a different rule, it is perfectly possible that the change of one o to a need not imply the change of the other o to a.

What remains as an unanswered question is the behavior of the //o// in the prefixes (see (14) above). Recall that this o never changes to a. However, there is no reason for concern. In Polish it is generally true that only phrase phonology rules can affect segments at the juncture between the prefix and the stem. To accomodate such facts, Booij and Rubach (1984) have proposed that prefixes are phonological words. This proposal is supported additionally by the observation that resyllabification is blocked at prefix junctures but not at morpheme junctures (see Booij and Rubach 1984). In sum, there is nothing unusual in the behavior of the prefix //o// toward Vowel Harmony. Like many other rules in Polish, Vowel Harmony has the phonological word as its domain.

We seem to have arrived at the conclusion that the OCP does not operate in Polish. However, this fact need not be taken as an argument against the OCP itself. The same range of data can be accounted for by assuming that vowels and consonants are on the same tier. This will preclude the application of the OCP in the cases which we have analyzed. The intriging question is what happens if we have clusters of immediately adjacent identical vowels or consonants. Such structures will be subject to the OCP even if vowels and consonants are on the same tier.

Vowel clusters such as //oo// in koordynacja 'coordination' are of no interest since they do not meet the environment of any phonological rule. The relevant observations can be made by inspecting consonant clusters, to which we turn now.

3. Geminates

Polish has a class of words which have clusters of identical consonants[8]. The consonants are geminates in the sense that they are not separated by vowels at any stage of derivation[9] and that they are pronounced as long. Thus, a phonetic distinction is made between words such as Budda 'Buddha' and buda 'kennel'. The interesting fact is that clusters of identical consonants behave toward palatalization rules as if they were sequences and not geminates, that is, only the segment which is immediately adjacent to the palatalizing vowel is affected:

(22) a.

nom.sg.		loc.sg.
Budd+a 'Buddha'	-	Buddz+ie [budʑ+e]
gett+o 'ghetto'	-	getc+ie [getɕ+e]
pass+a 'spell'	-	pass+ie [pasś+e][10]
mirr+a 'myrrh'	-	mirrz+e [m'irž+e]

b.

Mekk+a 'Mekka'	-	Mekc+e [mekc+e] (loc.sg.)
miękk+a 'soft' (fem. nom.sg.)[11]	-	z+miękcz+y+ć [z+m'jeŋkč+i+ć] 'to soften'

Note: [c ʒ] - alveolar affricates
[š ž] - postalveolar fricatives
[č ǯ] - postalveolar affricates
[ś ź] - prepalatal fricatives
[ɕ ʑ] - prepalatal affricates

The OCP enforces multiple linking in all the examples in (22). We thus have the following representations:

(23)

nom.sg.: Budd+a	X X X X + X | | \ | | b u d a	Mekk+a	X X X X + X | | \ | | m e k a
loc.sg.: Buddz+ie	X X X X + X | | \ | | b u d e	Mekc+e	X X X X + X | | \ | | m e k e

These representations present a serious problem to our analysis. The question is how to avoid the application of palatalization rules to the left half of the geminate, that is, how to avoid generating *[mecc+e] for the correct [mekc+e].

In the cases where Coronal Palatalization (16) applies to the examples

in (22), we might try to resort to some manipulation in the statement of the spreading of [-back]. For example, we could perhaps try to spread it to one X slot but not to the other. (This is assuming that such a move would in general be permitted for segmental rules.) No such options seem to exist for the changes of velars in (22b). The crucial observation here is that velar palatalizations (First Velar and Second Velar, see Rubach 1984:chap.5) are purely feature changing operations which are devoid of any direct phonetic motivation: [+back] sounds (velars) are turned into [+back] affricates and fricatives. That is, the sounds produced by velar palatalizations are 'hard' and not 'soft'[12]. This contrasts with the obstruent inputs to Coronal Palatalization. They end up as phonetically 'soft' prepalatal consonants [ɕ ʑ ʨ ʥ]. In sum, while Coronal Palatalization may perhaps be construed as a rule of spreading, velar palatalizations may not. They must therefore be operations on the melody tier alone. Now multiple linking leads to incorrect derivations: at the melody level palatalization rules cannot tell the difference between singly and multiply linked consonants. Consequently, Mekk+a - Mekc+e ends up as the incorrect *[mecc+e]. That is, it is derived in the same manner as words such as bibliotek+a 'library' - bibliotec+e (loc.sg.).

There is a simple solution to our problem: assume that the OCP does not operate in Polish. The consequence of this assumption is that identical segments need not be multiply linked. Thus, the representations in (23) are replaced by those in (24):

(24)

nom.sg.:	Budd+a	X	X	X	X	+	X		Mekk+a	X	X	X	X	+	X				
		|	|	|	|		|				|	|	|	|		|							
		b	u	d	d		a			m	e	k	k		a				
loc.sg.:	Buddz+ie	X	X	X	X	+	X		Mekc+e	X	X	X	X	+	X				
		|	|	|	|		|				|	|	|	|		|							
		b	u	d	d		e			m	e	k	k		e				

With these representations it is clear that palatalization rules may affect only the immediately preceding consonant. In this way we derive the correct phonetic representations without any difficulty.

4. Conclusion

The picture that has emerged from our analysis is not particularly clear. The initial gains in applying the OCP to derived imperfectives are balanced by the fact that the OCP leads to considerable complications in some other areas of Polish phonology (section 2). For the OCP to adequately cover derived imperfectives, it would be necessary to assume that it applies in domains which are larger than the morpheme (section 2.2.). This runs afoul of McCarthy's (1986) results. Even if we ignore the domain problem, it still remains a fact that the OCP makes the statement of variation difficult, if not impossible (section 2.3.). The behavior of geminates (section 3) seems to outweigh the odds: the OCP should not operate in Polish. However, if this is true, then we have to accept the fact that Polish has Vowel Harmony, rule (10). This is unfortunate since Vowel Harmony seems inadequate as a rule because it encodes the information that it applies exclusively to the outputs of DI Lowering. The analysis is theoretically unsatisfying, although descriptively it is correct.

Appendix: Derived Imperfective Tensing

The reader will recall that we have assumed that Derived Imperfective Lowering is a separate rule from the rule known as Derived Imperfective Tensing. We will now briefly motivate this distinction.

As is well known, Polish exhibits a pattern of e - i/ɨ - zero vowel alternations, for example: zamek [-mek] 'lock' (N) - zamyk+aj+ą [-mɨk-] 'they lock' (DI) - zamk+a [-mk-] 'lock' (gen.sg.). These alternations are traditionally accounted for by postulating underlying high lax vowels of which one is palatalizing //ɪ̯// and the other is not //ɨ̯//. These vowels, called 'yers', lower to [e] before C$_{\#}$[13] and delete elsewhere by the context-free rule of Yer Deletion: zamek //zamɪ̯k/[9] → [zamek] vs. zamk+a //zamɪ̯k+a// → [zamk+a]. In derived imperfectives yers tense to [i ɨ], which blocks Yer Deletion. The tensing rule is as follows:

(25) DI Tensing $\{^{\text{ɪ̯}}_{\text{ɨ̯}}\}$ → $\{^{\text{i}}_{\text{ɨ}}\}$ / — C_o aj] DI

It is rule (25) that derives the [ɨ] in zamyk+aj+ą 'they lock' (DI).

Traditionally, DI Tensing is stated more broadly in order to include the alternations of //o// and [a] which are found in derived imperfectives (see Gussmann 1980:74). In other words, our rule of DI Lowering (9) is not recognized as separate from DI Tensing (25). As we will see, collapsing the two rules is an overgeneralization and it leads to a factually incorrect analysis.

The real generalization is the following: DI Tensing (25) applies only to the verbs which belong to the so-called C-stem class (for the classification of verbs, see Rubach 1984:35). These are the verbs that do not have any vocalic verbalizing suffixes. Compare the alternations of zero and i/ɨ in the following verbs (the i/ɨ are due to rule 25):

(26) za+czn+ą [-čn-] - za+czyn+aj+ą [-čɨn-]
'they will begin' 'they begin'

na+dm+ą [-dm-] - na+dym+aj+ą [-dɨm-]
'they will inflate' 'they inflate'

wy+sch+n+ą [-sx-] - wy+sych+aj+ą [-sɨx-][14]
'they will dry' 'they dry'

In contrast to the examples in (26), words which are verbalizations by adding a vocalic suffix are systematically excluded from the operation of DI Tensing. That is, in these words the yers do not tense to [i ɨ]:

(27) mydɪ̯+o 'soap' - mydeɫ (gen.pl.): e - zero alternation, hence //mɨdɪ̯ɪ̯// - mydl+i+ć //mɨdɪ̯ɪ̯+i+ć// 'to soap', where -i is the verbalizing suffix - na+mydl+aj+ą //na+mɨdɪ̯ɪ̯+i+aj+om// 'they soap' (DI)

win+a 'guilt' - win+n+y 'guilty' (masc., full form) - win+ien [v'iń+en] 'guilty' (masc., short form): e - zero alternation, hence //vin+ɪ̯n// - u+nie+win+n+i+č //-vin+ɪ̯n+i+č// 'to acquit', verbalization by adding -i - u+nie+win+n+iaj+ą 'they acquit', phonetic [-v'iń+ń+aj-] derived from underlying //-vin+ɪ̯n+i+aj+om//

Observe that the roots have underlying yers in both (26) and (27) but these yers surface as [i ɨ] only in (26). That is, DI Tensing (25) applies if the root is not followed by the vowel of the verbalizing suffix. Clearly it must be this vowel that blocks DI Tensing in (27). The verbalizing vowel is not found in the phonetic representation of derived imperfectives since Polish, like other Slavic languages, has a rule that simplifies vowel clusters. This rule was originally discovered by Jakobson (1948):

(28) Vowel Deletion $\quad V \rightarrow \emptyset \; / \; \text{—} \; V \;]_{\text{Verb}}$

The derivation of za+czyn+aj+ą 'they begin' (see 26) and na+mydl+aj+ą 'they soap' (see 27) proceeds as follows. We omit the prefix cycle and the WFRs:

(29)	(za)čɨn+aj+om	(na)mɨdɫɨ+i+aj+om	
Cycle 2	čɨn+aj	mɨdɫɨ+i	
	čin+aj	-	DI Tensing (25)
	-	-	Vowel Deletion (28)
	-	mɨdɫ+i	Coronal Pal. (16)
Cycle 3	čin+aj+om	mɨdɫ+i+aj	
	-	-	DI Tensing
	-	mɨdɫ+aj	Vowel Deletion
	-	-	Coronal Pal.
Cycle 4	-	mɨdɫ+aj+om	
		BLOCKED	DI Tensing
		-	Vowel Deletion
		-	Coronal Pal.
Postcyclic	-	mɨdl+aj+om	Yer Deletion (context-free)

The Strict Cyclicity Constraint blocks the application of DI Tensing on cycle 4 since the structure /mɨdɫ+aj/ is not derived on that cycle.

In sum, the relevant generalization capturing the different behavior of the words in (26) and in (27) is expressed by ordering DI Tensing before Vowel Deletion and hence the verbalizing suffix //i// can block the tensing.

With this conclusion in mind let us return to our original examples which motivated the postulation of DI Lowering (recall the examples in (1) above). They are all verbalizations by adding the suffix //i//, that is, they are entirely parallel to the words in (27). For instance:

(30) prost+y 'simple', -y is the nom.sg. ending - u+proɕc+i+ć //u+prost+i+ć// 'to simplify', where -i is the verbalizing morpheme and -ć is the infinitive suffix - u+praszcz+aj+ą //u+prost+i+aj+om// 'they simplify': the imperfective form derived by adding -aj to the verb stem //u+prost+i//

Also: głos 'voice' - głos+i+ć //głos+i+ć// 'to voice' o+głos+i+ć //o+głos+i+ć// 'to announce' - o+głasz+aj+ą 'they announce' (DI), etc.[15]

Notice that as long as the verbalizing //i// is there, DI Lowering cannot apply since we know that the presence of an intervening vowel blocks the rule, compare na+gromadz+aj+ą 'they accumulate': the o remains unaffected. Consequently, in order for DI Lowering to have a chance to apply, it must be ordered after Vowel Deletion. This precludes the possibility of collapsing DI Tensing and DI Lowering. The two rules have different ordering. The proper sequence is: DI Tensing, Vowel Deletion, DI Lowering.[16]

NOTES

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[1]I use double slashes // // to enclose underlying representations, single slashes / / for intermediate stages and the traditional [ ] for phonetic representations.

[2]Phonetically, the 'nasal vowels' are nasal only before fricatives, where they are part of nasal diphthongs. Before stops and affricates they are represented as sequences of oral vowels and nasal consonants, compare the data in (3). For a theoretical discussion of 'nasal vowels', see Rubach (1984:chapter 5).

[3]Steriade and Schein's system which has been adopted from Clements (1985) and Halle (1986) assumes the structure of nodes whose hierarchy is as follows. The root node which is linked directly to the skeleton groups the laryngeal and the supralaryngeal nodes. The supralaryngeal node dominates the feature [nasal] and the place node. The place node includes three further nodes: coronal (features: anterior, distributed and lateral), dorsal (features: high, low and back) and labial.

[4]With this assumption, our analysis is parallel to the analysis of Javanese in Kenstowicz (1986), from which I have drawn much inspiration.

[5]I have not studied the ways of formalizing Coronal Palatalization in an autosegmental framework. Perhaps such a study might uncover a way of avoiding the difficulties that arise in the analysis that recognizes multiple linking. Note further that Steriade and Schein's (1986) Inapplicability Condition (developed from Hayes 1986) is of no help. First, it is not clear whether the Condition would be applicable since it refers to rules that involve two tiers, one of which is normally the skeleton. This is not the case in our rules. Second, assuming that the Inapplicability Condition could be evoked, it would lead to an incorrect result since Coronal Palatalization would be blocked in its application to both segments (see the examples in (18) below).

[6]This form is listed in Słownik poprawnej polszczyzny (Dictionary of Correct Polish).

[7]Much fieldwork is necessary to establish the exact nature of this variation.

[8]Most but not all of these words are borrowings from the etymological point of view.

[9]Phonetically, there are many more 'long consonants' but they are derived from representations which contain an intervening vowel. The vowel is deleted in the course of phonological derivation. Thus, they are not geminates at the underlying level.

[10]The first three examples (but not the others below) may end up with phonetic geminates [ʒʒ ɕɕ ʂʂ]. However, this happens only in rapid speech (see Rubach 1984:104 n.7). In slow speech the contrasts are very clear.

[11]Phonetically, we have a single [k] here due to Degemination which applies in the context of consonants (see Rubach 1984:105 n.19). Note: the nasal vowel letter ę stands for a sequence of a vowel and a nasal consonant. The pronunciation of miękk+a is [m'jeŋk+a].

[12]Historically, they used to be 'soft' but lost their [-back] specification some four hundred years ago, that is, they 'hardened'. In other words, at some point in the history of Polish velar palatalizations may have been phonetically motivated and hence then they were probably best stated as rules of spreading.

[13]This is a simplification. Below, also some other simplifications are made. For a more complete account of both yer lowering and verb morphology, see Rubach (1984).

[14]The morpheme represented as -n in the perfective form is regularly dropped before -aj (see Rubach 1984:88ff.).

[15]The remaining verbs in (1) are derived from nagrod+a 'reward' (N) and zbroj+a 'armor', respectively.

[16]In Kenstowicz and Rubach (1986) it is argued that in Slovak yers are segments at the melody tier with no representation at the skeletal and the syllabic tiers. This interpretation can be easily extended to Polish. Its consequence is that DI Tensing (25) must be replaced by a rule which inserts the slot X along with the nucleus N. With this interpretation of the yers, the argument for the separation of DI Tensing and DI Lowering becomes much stronger. The two rules perform totally different operations and hence they could not be collapsed even if the ordering problem did not arise.

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WHAT IS A BANTU NOUN CLASS?

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Traditional Bantu grammars have tended to confuse the concept "lexical noun class" with the concept "morphological agreement pattern". This study will show that an efficient formal grammar must include both of these concepts separately.

Following a general overview of Kiswahili agreement patterns, there is data showing how the system gives special treatment to animate nouns: they trigger animate agreement regardless of the prefix on the noun. However, kinship terms, if unprefixed in the singular, usually trigger Class 9/10 agreement on possessives, rather than animate agreement. It will be shown that the traditional description of possessive agreement for these nouns is not synchronically accurate: it errs both in predicting animate agreement where Class 9/10 agreement is used and vice versa.

While the traditional account may reflect the correct historical motivation for this irregularity in the system, a more accurate account can be framed in terms of juxtaposition or non-juxtaposition within a noun phrase.

1. Introduction

Bantu languages have a "robust" agreement system in which noun-class membership plays an important role. This study will investigate how these noun classes can best be handled in a formal grammar. Traditional Bantu grammars, perhaps because of their original pedagogical bent, have tended to confuse the concept "lexical noun class" with the concept "morphological agreement pattern". We will see that an efficient formal grammar must include both of these concepts separately.

The study is theory-independent in that it will refer to "syntax", "lexicon", "semantics", and "phonology/morphology", trusting that any theory will have components corresponding to these or some way to do the work that these components would do in another theory. Examples will be drawn mostly from Swahili to show that in an efficient grammar, rules controlling agreement morphology must be allowed to refer to all four of the components just mentioned; otherwise generalizations will be missed and significant semantic distinctions will be ignored.

The study will begin with a review of the Swahili agreement system. It will be shown that agreement in Swahili can be both arbitrary and semantically significant. Alternately trying two approaches--the "possible agreement patterns" approach and the "lexical class" approach--I have

investigated the results of "splitting" as much as possible and "lumping" as much as possible. I have concluded that an efficient grammar will incorporate both approaches in ways that are not far from the traditional analysis in spirit, though formally different.

In the course of investigating difficulties in the description of the noun-class system, I will show that the traditional description of possessive agreement for a group of (mostly) kinship terms is not synchronically accurate for most speakers, and I will propose another description to replace it.

2.0 Grammatical Agreement

There are two ways to approach agreement in a Bantu language. The first approach is the "possible agreement patterns" approach, which has been the traditional approach. This consists in taking (theoretically) each noun in the language in turn and combining it with a verb, a demonstrative, an adjective, a possessive, etc. and noting the agreement morphology, which constitutes its "agreement pattern". The results of this survey are then submitted to linguistic analysis to determine how many "basic" agreement patterns there are. To paraphrase W. A. A. Wilson, a "class" has traditionally consisted of a group including all the substantives which bear the same agreement affix and which trigger the same agreement on the words which depend on them grammatically [Sauvageot 1963: 281].

Note that many of these patterns represent corresponding pairings of singular and plural, but in the traditional approach each pattern is given a separate number. While this seems odd at first, it does lead to efficiency in the gram- mar. For instance, Swahili nouns with Class 9 and Class 11 singulars share the plural Class 10, so that its forms only need to be included once in the grammar. In some related languages the situation is even more complex. In Dzamba and Likila, not only do Classes 9 and 11 share a Class 10 plural, but singular Classes 5 and 14 share plural Class 6 [Bokamba 1981: 110]. Moreover, some Class 9 nouns in these languages and others (Lingala, Libinza, Bobangi) are being reanalyzed to have Class 2 or Class 6 plurals [ibid.: 33].

In related non-Bantu languages the situation may be still more involved. In Balanta, a West African language spoken in Guinea Bissao, there are six lexical classes having singular-plural pairings (twelve potential agreement patterns), but they share only seven actual agreement patterns: Group A nouns trigger Agreement Pattern 1 in the singular and Agreement Pattern 2 in the plural, as one would expect; Group B nouns trigger Agreement Pattern 3 in the singular but share plural Agreement Pattern 4 with Groups C and F, the singular of Group C triggering Agreement Pattern 5; worse yet, Group D, whose singular triggers Agreement Pattern 6, takes Agreement Pattern 3 in the plural (which you recall was singular for Group B), as does Group E, which shares singular Agreement Pattern 7 with Group F, which, like Groups B and C, triggers Agreement Pattern 4 in the plural [Wilson 1961]. In such cases, numbering "classes" consecutively regardless of function represents a substantial savings in the grammar.

The second approach to agreement is the "lexical class" approach; this involves finding all nouns in the language which trigger the same agreement pattern(s), singular and plural, and assigning them to one lexical classification. Thus, in the Balanta example above there were only six lexical groups (A-F), although there were seven agreement patterns. There is nothing in traditional Bantu linguistics corresponding to this notion. No doubt these "lexical groups" are a more useful and efficient characterization of "noun class" than the traditional definition, which should be called "agreement pattern". However, bowing to tradition, I shall continue to use the term "noun class" in the customary way with reference to Kiswahili.

2.1 Kiswahili Agreement

Because studies of Bantu languages have been comparative almost from the beginning of work by Western linguists, traditional "noun classes" have been numbered according to a pan-Bantu scheme which is claimed to correspond to the more than twenty classes reconstructed for *Proto-Bantu. This means that for a language like Kiswahili, which is traditionally described as having sixteen noun classes (agreement patterns), these "classes" are numbered 1-18, Classes 12-13 being omitted, since they are extinct in modern Kiswahili.

The sentences below show agreement markers for traditional lexical noun classes in Kiswahili. In some cases the markers are all very similar, but in others they are very dissimilar.

(1) Class 1: **M**tu **yu**le **m**dogo ali**m**piga **m**toto wangu.[1]
person that small SP+TA+OP+strike child my

(2) Class 2: **Wa**tu **wa**le **wa**dogo **wa**liwapiga watoto wangu.
'Those small people struck my children.'

(3) Class 3: **M**ti **u**le **m**dogo **u**liuziba **m**fereji wangu.
'That small tree blocked my ditch.'

(4) Class 4: **Mi**ti **i**le **mi**dogo **i**liiziba **mi**fereji yangu.
'Those small trees blocked my ditches.'

(5) Class 5: **J**iwe **l**ile dogo **l**ili**l**ipiga **j**icho langu.
'That small stone struck my eye.'

(6) Class 6: **Ma**we **ya**le **ma**dogo **ya**liyapiga **ma**cho yangu.
'Those small stones struck my eyes.'

(7) Class 7: **K**igumba **k**ile **k**idogo **k**ili**k**ichoma **k**idole changu.
'That small arrowhead pierced my finger.'

(8) Class 8: **V**iwe **v**ile **v**idogo **v**ili**v**ipiga **v**idole **v**yangu.

(9) Class 9: **N**dege **i**le **n**dogo **i**liigonga **n**yumba yangu.
'That small plane struck my house.

(10) Class 10: **N**dege **z**ile **n**dogo **z**ili**z**igonga **n**yumba zangu.

The table below shows sample nouns for all Swahili noun classes, together with the most important agreement markers.

(11) **SWAHILI AGREEMENT PATTERNS**

Gloss	CLASS	NOUN	ADJECTIVE	SUBJECT-AGREEMENT (Object-Agreement)	DEMONSTRATIVE	POSSESSIVE
'person'	1	mtu	m-	a- (m-)	yu-	wa
'persons'	2	watu	wa-	wa-	wa-	wa
'tree'	3	mti	m-	u-	u-	wa
'trees'	4	miti	mi-	i-	i-	ya
'mango'	5	embe	-[2]	li-	li-	la
'mangoes'	6	maembe	ma-	ya-	ya-	ya
'chair'	7	kiti	ki-	ki-	ki-	cha
'chairs'	8	viti	vi-	vi-	vi-	vya
'ring'	9	pete	n-[3]	i-	i-	ya
'rings'	10	pete	n-	i-	i-	za
'board'	11	ubao	m-	u-	u-	wa
'freedom'	14	uhuru	m-	u-	u-	wa
'coming'	15	kuja	ku-	ku-	ku-	kwa
'place' (specific)	16	mahali	pa-	pa-	pa-	pa
'place' (general)	17	mahali	ku-	ku-	ku-	kwa
'place' (inside)	18	mahali	m-	m-	m-	mwa

The agreement patterns above are essentially arbitrary; that is, there is no clear semantic reason 'mango' is Class 5--*embe lile* (**ile*) 'that mango'--while 'banana' is Class 9--*ndizi ile* (**lile*) 'that banana'. Yet, the traditional noun classes are not totally devoid of semantic content; it is merely that their semantic content is often vague and that it is valid for only a portion of the nouns which fall into that class. The following listing offers a few generalizations about nouns in various classes.

Class 1/2: contains only words for humans, but not all words for humans
Class 3/4: contains most plants, but many other words as well
Class 5/6: some loan-words; augmentatives; many liquids are Class 6
Class 7/8: prototypical "thing" class; utensils, tools, etc.; diminutives
Class 9/10: most loan-words; most plant products; proper place names
Class 14: contains only abstract nouns, but not all of them
Classes 16-18: location (specific, general, and interior, respectively)[4]

2.2 Animate Agreement

Most Swahili agreement operates arbitrarily: agreement is a function of the class membership of the noun. Animate nouns, however, trigger Class 1 agreement in the singular and Class 2 agreement in the plural, even if the noun itself forms its own plural according to the morphology of some other class.

(12) Yule mtume mdogo alimpiga mtume wa Kiislamu.
1 3 1 1 1 3 1 [class numbers][5]
that prophet small SP+TA+OP+strike prophet of Islam
*Ule *uliupiga [*Class 3 markers]

(13) Wale mitume wadogo waliwapiga mitume wa Kiislamu.
2 4 2 2 2 4 2
those prophets small struck prophets of Islam
*Ile *midogo *iliipiga *ya [*Class 4]

(14) Yule karani mdogo alimpiga karani wangu.[6]
1 5 1 1 1 5 1
that clerk small struck clerks my
*Lile *dogo *lililipiga *langu [*Class 5]

(15) Wale makarani wadogo waliwapiga makarani wangu.
2 6 2 2 2 6 2
*Yale *madogo *yaliyapiga *yangu [*Class 6]
'Those small clerks struck my clerks.'

(16) Yule kijana mdogo alimpiga kijana wa chuo.
1 7 1 1 1 7 1
that youth small struck youth of college
*Kile *kidogo *kilikipiga *changu [*Class 7]

(17) Wale vijana wadogo waliwapiga vijana wa chuo.
2 8 2 2 2 8 2
*Vile *vidodo *vilivipiga *vyangu [*Class 8]
'Those small youths struck the college youths.'

(18) Yule ngamia mdogo alimpiga ngamia wangu.
1 9 1 1 1 9 1
that camel small struck camel my
*Ile *ndogo *iliipiga *yangu [*Class 9]

(19) Wale ngamia wadogo waliwapiga ngamia wangu.
2 10 2 2 2 10 2
*Zile *ndogo *zilizipiga *zangu [*Class 10]
'Those small camels struck my camels.'

2.3 Irregular Cases

In the previous section we saw that animate nouns trigger Class 1/2 agreement even if the noun itself has singular/plural forms according to the morphology of another noun-class pair. Note, however, that there is a group of nouns with Class 5/6 or Class 9/10 morphology which usually trigger Class 9/10 agreement on a possessive or genitive -a. This is actually just one group of nouns, with an unmarked singular (no prefix) and an optional ma- prefix on the plural. Speakers vary in their treatment of these nouns; some speakers treat them all as unmarked in both singular and plural (Class 9/10), but for almost every noun, it is possible to find some speakers who will use a ma- prefix for the plural (Class 5/6). The nouns in this group all refer to human relationships: the words 'friend' and 'enemy' plus various kinship terms. For convenience, I will refer to these as "kinship" nouns; bear in mind, however, that only Class 5/6 or Class 9/10 nouns referring to human relationships are included in this group.

Since the possessives and genitive -a always show the same agreement prefixes, examples of one will serve to illustrate both, and claims made for "possessives" can be considered to be valid for genitive -a as well.

(20)
Yule rafiki mdogo alimpiga rafiki yangu.[7]
1 5 1 1 1 5 9 [cf. (14)]
that friend small struck friend my

(21)
Wale marafiki wadogo waliwapiga marafiki zangu.
2 6 2 2 2 6 10 [cf. (15)]
'Those small friends struck my friends.'

(22)
Yule nyanya mdogo alimpiga nyanya yangu.
1 9 1 1 1 9 9 [cf. (18)]
that granny small struck grandma my

(23)
Wale nyanya wadogo waliwapiga nyanya zangu.
2 10 2 2 2 10 10 [cf. (19)]
'Those small grannies struck my grandmothers.'

However, this irregularity does not always appear; sometimes the possessive agreement reverts to the animate Class 1/2 marker (w-):

(24)
nyanya yangu (*wangu) BUT Nyanya mdogo ni wangu (*yangu).
9 9 *1 9 1 1 *9
grandma my The small granny is mine.

2.31 The Traditional Account

The traditional description for this exception to animate agreement is that Class 9/10 possessive agreement is used whenever the number of the noun has not already been established in the sentence. Actually, this is probably the correct historical motivation for this agreement peculiarity. Recall that Class 9/10 nouns are unmarked for number: that is, whatever the prefix--zero or nasal--it is the same for both singular (Class 9) and plural (Class 10). Now, by coincidence, the possessive prefixes for

Classes 1 and 2 are the same (w-). Since Swahili usually marks number overtly, noun phrases with no number marking were unacceptable to Swahili speakers, so that instead of the expected, semantically motivated animate (Class 1/2) agreement, they chose the morphologically indicated Class 9/10 agreement, which would unambiguously mark number.[8]

The extension of this Class 9/10 pattern to Class 5/6 nouns referring to human relationships is not strange if we recall that we are essentially dealing with the same set of nouns in each case, the only difference being the variable use of the ma- plural prefix, which may even be an innovation (for these ounss)) ppoosstt--ddaattiinngg tthhee ppoosssessive agreement pattern.

It may be that there are speakers of Swahili for whom the historical account is synchronically accurate, but for many this is no longer true. The following noun phrases are counterexamples to the Traditional Account, in that they exhibit Class 9/10 agreement despite the fact that the number of the noun is already clearly marked in the morphology before the possessive appears. In (25) the yu- prefix on the preceding demonstrative marks the noun phrase as singular (Class 1); in (26) the ma- prefix on the noun itself marks it as plural (Class 6).

(25) **yu**le rafiki yako (*wako)
1 9(5) **9** *1
that friend your

(26) **ma**rafiki zangu (*wangu)
6 **10** *2
friends my

Further counterexamples to the Traditional Account are shown below in (28) and (29).

2.32 A Counterproposal

Since the Traditional Account fails to describe accurately the speech of Kiswahili speakers, we must seek a more satisfactory account. I claim that most speakers use a simple rule of involving word-order and syntactic structure.

(27) **Kinship Agreement Principle**: Within a noun phrase, if a possessive or genitive -a modifies and follows immediately a "kinship" noun (Class 5/6 or 9/10 morphology, referring to a human relationship), then it takes a Class 9 (singular: y-) or Class 10 (plural: z-) agreement marker.

Otherwise, the expected animate Class 1/2 agreement (w-) will appear.

The following data illustrate the superiority of this description in that the Kinship Agreement Principle correctly predicts their animate Class 1/2 agreement while the Traditional Account incorrectly predicts Class 9/10 agreement. As such they are further counterexamples to the Traditional Account.

(28) dada za bibi BUT Dada bashashi wa bibi walikuja.
10 10 10 unmarked 2 2
sister of woman sister charming of woman came
*wa *za
*2 *10

(29) bibi yangu/zangu BUT Bibi si wangu (*yangu/*zangu).
9/10 9 10 9/10 1/2 *9 *10
wife my wife not my = 'That woman is not my wife.'
OR 'Those women aren't my wives.'

In the sentence in (28), dada at the beginning of the sentence could be either singular (Class 5 or 9) or plural (Class 10); it is not until the Class 2 subject-verb agreement prefix on the last word in the sentence that the listener knows that the subject was plural. Thus, since bashashi is a borrowed adjective which does not inflect, the number of dada is still indeterminate at the point the genitive -a appears; but instead of the Class 10 agreement marker z- predicted by the Traditional Account, we get animate Class 2 agreement (w-), because the genitive -a does not follow dada immediately.

The sentence in (29) is even more striking, in that it is ambiguous for number. Bibi at the beginning of the sentence could be either singular (Class 5 or 9) or plural (Class 10). Since the negative copula si is uninflected, the number of the subject is still indeterminate when we arrive at the predicate possessive, which, instead of the Class 9 (singular) or 10 (plural) marker predicted by the Traditional Account, takes an ambiguous w-, which could be either Class 1 or 2, as the Counterproposal correctly predicts.

Note that the Class 9/10 possessive agreement will not appear if the possessive and its noun are not in the same noun phrase. In Swahili the "generalized" copula ni can optionally be omitted. Notice the agreement below:

(30) Direct Modification: bibi yangu (*wangu)
9 9 *2
wife my = 'my wife'

(31) Predicate Possessive: Bibi ni wangu (*yangu).
9 1 *9
wife is my = 'The woman is my wife.'

(32) Omitted Compula: Bibi wangu (*yangu).
9 1 *9
wife my = 'The woman is my wife.'

The words in (30) are a noun phrase; because the possessive immediately follows its Class 9 noun referring to a human relationship, it takes a Class 9 prefix (y-). Sentence (32), while composed of the same lexemes, is not a noun phrase, but a sentence; since the possessive and its noun are not in the same noun phrase, animate Class 1 agreement prevails.

The noun-phrase test is not sufficient by itself, however. The

sentence in (28) shows that even within a noun phrase, the non-animate Class 9/10 agreement will fail if another word intervenes between the noun and its possessive or genitive -a.

2.33 Irregular Hybrids

Semantic attraction has pulled a handful of otherwise regular Class 1/2 nouns into the pattern described in the previous section, in the plural only. They are all kinship terms:

(33) mke wangu (*yangu) BUT wake zangu (*wangu)
1 1 *9 2 10 *2
wife my 'my wives'

(34) mkwe wako (*yako) BUT wakwe zako (*wako)
1 1 *9 2 10 *2
father-/mother-in-law your 'your parents-in-law'

(35) mjukuu wetu (*yetu) BUT wajukuu zetu (*wetu)
1 1 *9 2 10 *2
grandchild our grandchildren our

Since, in the plural, these nouns trigger agreement just like the "kinship nouns" described in the previous section, despite the fact that the number of the noun is unambiguously marked by the prefix of the noun itself, they are further evidence that the Traditional Account is unsatisfactory. However, once we specify that these nouns behave like "kinship nouns" in the plural (as if they had Class 5/6 or 9/10 morphology), then the Kinship Agreement Principle correctly predicts their possessive agreement: Class 9/10 for immediately-following possessives within a noun phrase; Class 1/2 otherwise.

(35) mjomba wa Juma wajomba za Juma
1 1 2 10
(maternal) uncle of Juma 'Juma's uncles'
*ya (*9) *wa (*2)

(36) BUT wajomba wadogo wa Juma
2 2 2
uncles small of Juma
*za (*10)

There are a few Swahili speakers who treat possessives modifying Class 9/10 animals in this way: Class 1 for the singular; Class 10 for the plural:

(37) Wale ngamia wadogo waliwapiga ngamia zangu.
2 10 2 2 2 10 10
*Zile *ndogo *zilizipiga
'Those small camels struck my camels.'

See (18) for the singular; cf. (19) for the usual plural version.

3.0 Theoretical Implications

3.1 Agreement Patterns

Splitting: How many agreement patterns could Swahili be analyzed to have, at the maximum? Well, if we take into account all of the variability described above under "Animate Agreement" (but ignoring the problems of word order)[10] plus phonological variation, there are potentially forty-five or more.

Now, such a taxonomy assumes a very weak phonology, so that every allomorph would have to be called independently by means of some marking in the lexicon. With a more reasonable phonology, we can eliminate most of the phonological variation above, but to get rid of every single such entry will require a very powerful phonology indeed, with plenty of abstract segments deleted at the end of the cycle, unfilled metrical nodes, autosegmental matrices, etc. But these questions are not the issue here. Assuming we can eliminate all of these variants, we still have thirty-one agreement patterns or more, with most of the obvious duplication arising from animate agreement. When one considers that many of these patterns can easily be defined in terms of parts of other agreement patterns, as a function of some semantic or phonological variable, it seems clear that this number is at least twice too high.

Lumping: Then, how few agreement patterns, at the minimum, could we conceivably analyze Swahili to have? As it turns out, the answer--13--is not far from the traditional analysis: 16, the gains coming from lumping infinitives with non-specific locatives and throwing Classes 3, 11, and 14 together.

Traditional descriptions have eschewed such a radical contraction of the agreement system because it ignores important semantic distinctions. Most linguists would agree that the Class 15 infinitive marker and Class 17 general locative agreement are not synchrocally related, semantically. Likewise, it seems misguided to ignore the fact that traditional Class 14 nouns are all abstract and have no plural, even though otherwise they are indistinguishable from Class 11 nouns. Indeed, disregarding the prefix on the noun itself, both of these are just like Class 3, except that Class 3 nouns take a Class 4 plural, whereas Class 11 nouns take a Class 10 plural. Since traditional descriptions of Bantu languages tend to confuse the concepts of lexical classes and agreement patterns, they will opt to retain two identical sets of agreement markers in order to keep the identity of the nouns involved semantically distinct.

3.2 Lexical Classes

Under the "agreement pattern" approach above, agreement patterns for Kiswahili words were listed, treating singular and plural distinctly. In order to set up efficient lexical classes, however, we will need to establish the number of possible singular-plural pairings, in addition to any classes with lexical content (like infinitive verbs) where number is not an issue.

Splitting: Then, how many lexical noun classes, at the maximum, could be defined for Swahili? Depending on the speaker, there are 31-33.

As before, this analysis assumes a very impoverished phonology. It will take only a moderate amount of abstraction in the phonology to reduce this list to 19-21 lexical classes, or even 17-19. This is beginning to approach a reasonable range, but still involves too much duplication among the animates, which account for up to half of the entries.

Lumping: By lumping as much as possible, it might be possible to reduce the number of lexical noun classes to eight:

(38)

Ad Hoc ID	Traditional Class No.	Example	Gloss
i	1/2	**mtu**/**watu**	'person(s)'
ii	3/4	**mti**/**miti**	'tree(s)'
iii	5/6	**jiwe**/**mawe**	'stone(s)'
iv	7/8	**kiti**/**viti**	'chair(s)'
v	9/10	dakika/dakika	'minute(s)'
vi	14 & 11/10	**ubao**/**mbao**	'board(s)'
vii	15	**kusema**	'speaking'
viii	16-18	mahali	'place'

Now, traditional descriptions have not set up lexical classes (essentially pairings of agreement patterns) as we have here, but if they had, they would define only a few more lexical noun classes than we have: probably a separate category for traditional Class 14, perhaps a separate category for Class 6, and, at the outside, a category for uniquely Class 10 nouns, for those speakers who have such a class.

This conservative attitude, implicit in the organization of the grammars, though not stated, reflects a valid intuition: the other agreement patterns and lexical classes can be derived by rule from these basic ones, by reference to the meaning of the noun.

3.3 Proposed Organization of Grammar

I propose that an efficient grammar for Swahili would incorporate both of the approaches outlined here: agreement patterns and lexical classes. Nouns in the lexicon would be marked as belonging to one of 11-12 lexical classes (to be specified below). The rules of the morphosyntax and morphophonology would then generate affixes by referring to this information, as well as the syntactic structure and the meaning of the noun, to determine which of fourteen possible agreement patterns (to be specified below) to choose to find the appropriate affix.

Agreement Patterns: The fourteen agreement patterns to be recorded in the morphology would be only slightly expanded from a maximally "lumped" analysis (by treating traditional Class 3 as distinct from Classes 11 and 14).

(39) Label	Traditional Class No.	Sample Trigger	Gloss
A-S	1	mtu	'person'
A-P	2	watu	'people'
B-S	3	mti	'tree'
B-P	4	miti	'trees'
C-S	5	jiwe	'stone'
C-P	6	mawe	'stones'
D-S	7	kiti	'chair'
D-P	8	viti	'chairs'
E-S	9	dakika	'minute'
E-P	10	dakika	'minutes'
F	11/14	ubao	'board'
G	15/17	kusema	'speaking'
H	16	mahali	'place'
J	18	mahali	'place'

In any case, the savings over the traditional taxonomy arises from collapsing traditional Classes 15 and 17 into [G] and Classes 11 and 14 into [F]. Traditional descriptions have not been able to realize this economy because they confused two separate functions--agreement patterns and lexical classes--in one set of categories. Class 15 (infinitive verbs) and Class 17 (general locatives) needed to be kept separate for lexical and semantic reasons; it was considered a coincidence that they had exactly the same markers throughout the paradigm. Now they can be separate lexical classes which coincidentally call for the same agreement pattern [G], but once they have called for the same pattern, the fact that the two paradigms are identical is predicted by the grammar. Similarly, traditional Classes 11 and 14 were kept separate because nouns in the former took a plural in Class 10 while those in the latter were all abstracts with no plural. Now they can retain separate status as lexical classes sharing one agreement pattern in the morphology.

Lexical Classes: Nouns in a Kiswahili lexicon should refer to one of 11-12 lexical noun classes, the number depending on whether the speaker has a class of uniquely (traditional) Class 10 nouns or not. This is three more than the absolute minimum--8, cf. (38). I have chosen to set up separate classes for uniquely (traditional) Class 6 nouns--mostly liquids--and traditional Class 14--abstracts with no plural--as well as a separate class for (traditional) Class 1/2 nouns that pattern like mke (1/10 possessive agreement).

(40) Label	Traditional Class No.	Example	Gloss
I	1/2	**m**tu/watu	'person(s)'
II	3/4	**m**ti/miti	'tree(s)'
III	5/6	**j**iwe/**m**awe	'stone(s)'
IV	7/8	**k**iti/viti	'chair(s)'
V	9/10	dakika/dakika	'minute(s)'
VI	11/10	ubao/**m**bao	'board(s)'
VII	15	**ku**sema	'speaking'
VIII	16-18	mahali	'place'
IX	1/2	**m**ke/wake	'wife/wives'
X	6	**m**aji	'water'
XI	14	**u**huru	'freedom'
[XII][11]	10	pesa	'money'

It makes sense to set up separate classes in the lexicon for nouns like maji and uhuru which have no corresponding singular or plural. While these groups are semantically well motivated--liquids, abstracts, etc.--there is no absolute way to predict from meaning, for instance, whether a noun will be in Class VI (traditional 11) or XI (traditional 14): Why does ubishi 'opposition, contrariness' have a plural mbishi 'oppositions', while ukaidi 'contrariness, obstinacy' does not? These classes will have to be formally distinguished in the lexicon.

Class IX (mke, etc.) is a rather unfortunate class. It contains only four lexical items or so, and all of its behavior, however aberrant, merely mimics that of other classes and sub-classes. Still, as there is no way to predict neatly from meaning exactly which nouns fall into this group and which do not, we must mark them in the lexicon. This is a case where an exceptional pattern in the language forces an undesirable but necessary wrinkle in the grammar.

3.4 Why both approaches?

It might be argued that it would be more efficient for entries in the lexicon to access agreement patterns directly, rather than passing via the intermediate lexical noun class. Thus, the entry for -tu 'person' would call for Agreement Pattern A-S if singular--mtu--and A-P if plural--watu. However, this system would lead to a great deal of duplication, in that singular and plural agreement patterns would have to be specified separately for every noun. Essentially, this system would claim implicitly that it was a coincidence that all nouns with Agreement Pattern A-S for the singular had agreement pattern A-P for the plural; by stating in the lexicon only that -tu 'person' belongs to Lexical Noun Class I, we capture the generalization by accessing the agreement patterns via rule in the morphological component, based on the lexical noun class.

For classes with no corresponding singular or plural, this argument will not hold, but in those cases we can argue in favor of separate lexical classes for semantic distinctions--we want to encode somewhere the fact

that some words are infinitives while others triggering the same agreement are locatives--and for consistency within the grammar: it would seem "messy" to access agreement for some nouns directly from the lexicon and for others via intermediate rules in a morphological component.

Rules: For illustrative purposes, I will show some examples of how rules would interact with the Agreement Patterns and Lexical Noun Classes that I have proposed above. Bear in mind that these rules are included here only as examples and that only the **content** of the rules is at issue; what formalism they contain is ad hoc, and no claim is made regarding form. The rules below are stated in a form assuming ordered, disjunctive application: i.e., once one rule has applied, subsequent rules are disregarded. However, these same rules could be formulated in a way which would not require disjunctive application; similarly, the elsewhere conditions could be avoided by a restatement of the complementary set of conditions of an earlier rule.

These rules also incorporate some language-specific features, which refer to semantics, such as [+ kinship], defined here as "referring to a human relationship". The ordering given here is not crucial in every instance; for example, the first two rules could equally well follow Rule 10.

Note also that these rules depart from tradition by categorizing nouns by their own morphology rather than by the agreement they trigger on verbs. The system outlined here, however, would also work if verb-agreement were retained as the primary consideration in category assignment.

Lexical Class	Rule Number	Features & Conditions	Agreement Pattern
III or V	1.	[+ kinship], for a possessive immediately following its noun in the same noun phrase	(follow Rules 9-10)
IX	2.	[+ pl.]	(follow Rule 1)
II		[+ noun]	
	3.	[- pl.]	B-S
	4.	[+ pl.]	B-P
III		[+ noun]	
	5.	[- pl.]	C-S
	6.	[+ pl.]	C-P
IV		[+ noun]	
	7.	[- pl.]	D-S
	8.	[+ pl.]	D-P

Lexical Class	Rule Number	Features & Conditions	Agreement Pattern
V		[+ noun]	
	9.	[- pl.]	E-S
	10.	[+ pl.]	E-P
any		[+ anim.]	
	11.	[- pl.]	A-S
	12.	[+ pl.]	A-P
II.	13.	elsewhere	(follow Rules 3-4)
III.	14.	elsewhere	(follow Rules 5-6)
IV.	15.	elsewhere	(follow Rules 7-8)
V.	16.	elsewhere	(follow Rules 9-10)
VI.			
	17.	[- pl.]	F
	18.	[+ pl.]	E-P
VII.	19.		G
VIII.			
	20.	[+ inside]	J
	21.	[+ spec.]	H
	22.	[- spec.]	G
X.	23.		C-P
XI.	24.		F

These rules will only access the basic, underlying representations of the agreement morphemes. A (sometimes formidable) phonology will still be needed to generate correct surface representations.

Naturally, a more ambitious "lexical-phonology" in the grammar might try to capture even more generalizations by having certain features attached to nouns by cyclic and/or stratal rules rather than specified in the lexicon. But whether a noun ends up marked Lexical Class I because it is [+ anim.] (after the exceptional cases have been disjunctively marked) or gets assigned Class I by specification in the lexicon, this same basic organization will still be needed in the grammar for the same reasons.

3.5 Cross-Bantu

Is this system of organization for a grammar for dealing with agreement morphology equally valid for all Bantu languages? If there were a Bantu language where the agreement was done by copying, pure and simple, then this system would be an unnecessary expense. Perhaps the language that

comes closest to using pure copying rules is Likila. Even here, only eight out of twelve agreement patterns can be generated solely by copying (and a little phonology) [Bokamba 1981: 110].

The lexical-noun-class step would also not be needed for a language where lexical items triggered singular and plural agreement in a random or nearly random manner, so that a noun's singular agreement gave no clue at all as to its plural agreement. But even in the Balanta data outlined at the beginning of this study, where the noun-class system is more convoluted than that of any Bantu language, the number of singular-plural pairings (6) is far fewer than the potential forty-nine that random combination would have generated from seven agreement patterns. Given a Balanta singular, there are at most two agreement patterns in the plural; given a plural, there are at most three agreement patterns possible for the singular. So it is safe to say that for every Bantu language, there are important, systematic generalizations to be captured by formal Lexical Noun Classes.

3.6 Cross-Linguistic

This system of organization ought to be valid for any language where arbitrary and phonetically dissimilar agreement markers associate in regular singular-plural pairs with given sets of lexical items; it also works well for other sets of agreement markers, such as the locatives. So, lexical noun classes as outlined here are found in virtually all languages related to the Bantu sub-family. Even for a language whose noun-class system is as vestigial as Wolof's, some economy can be achieved through this organization of the morphology, in that rules testing for number can be stated once in the morphology, rahter than begin repeated inside each noun's lexical entry.

Of course, for languages with less complex noun-class sytems, such as Indo-European gender, the savings will be less, but this system, which is generally assumed in descriptions of languages with arbitrary gender, is still valid.

3.7 Further Research

With new models of "lexical phonology" being developed, it should be possible to construct formally a thorough account of word formation in Kiswahili. From a comparative/historical standpoint, descriptions based on the system outlined here should provide better insights into language change, since variation and shift in surface forms could be explained more precisely in terms of rule changes and mergers, indexing changes, ordering changes, etc.; in some cases, a small change in one part of the morphology might be reflected in a wide variety of surface changes.

4. Conclusion

We have investigated how Bantu noun classes can best be handled in a formal grammar. I have shown that traditional grammars have erred in confusing two category systems that ought to have been treated separately:

agreement patters and lexical noun classes. I have argued that in an efficient grammar, rules controlling agreement morphology must be allowed to refer to semantics, syntax, morphophonology, and lexical category to avoid missing generalizations and significant semantic distinctions. The system outlined here, incorporating both agreement patterns and lexical noun classes, allows us to exploit this power in an efficient manner.

I have proposed categorization systems for agreement patterns and lexical noun classes which take into account both the arbitrary and semantically significant aspects of Swahili agreement. In the course of investigating difficulties in the description of the noun-class system, I have shown that the traditional description of possessive agreement for a group of (mostly) kinship terms is not synchronically accurate for most speakers, and I have proposed another description to replace it.

NOTES

[1]SP = Subject-agreement Prefix; TA = Tense/Aspect marker (li = past; na = present); OP = Object-agreement Prefix.

[2]Some short Class 5 nouns have the prefix ji-.

[3]Class 9/10 is called the "nasal class" because many of its nouns, especially those whose stems begin with a voiced segment, have a nasal prefix.

[4]The locative classes 16-18 have almost no lexical content of their own; nouns enter these classes by adding the locative suffix -ni; the class membership of such a derived noun will be a function of the meaning intended by the speaker: specific, general, or inside location.

[5]The prefix of mtume is only Class 3 in contrast to its Class 4 plural mitume; taken alone, the prefix could be interpreted as Class 1. The other examples are more compelling.

[6]The zero prefix of karani is only Class 5 in contrast to the Class 6 plural makarani; taken alone, the zero prefix could be considered Class 9. Indeed, many speakers use an unmarked (Class 10) plural for this word. In any case, Class 9 agreement is also ungrammatical:

*Ile karani *ndogo *iliipiga karani *yangu.

[7]See footnote 6, mutatis mutandis.

[8]It is not an issue here whether the semantic (Class 1/2) agreement was original and the Class 9/10 agreement an innovation or whether the morphological (Class 9/10) agreement was original and resisted the generalization of animate agreement in a few cases for communicative reasons. There is perhaps weak evidence to suggest the latter [Richardson 1967: 382ff].

[9]It is awkward to formulate an example in isolation to show a possessive separated from its noun within a noun phrase, because of a general requirement of Swahili noun-phrase structure that a possessive follow its noun immediately. However, since possessives and genitive -a pattern alike everywhere else, the genitive -a examples can be considered compelling for the possessives as well. Indeed, some linguists analyze the possessive adjectives as being comprised of an agreement prefix plus genitive -a plus a possessive stem (viz. -ngu, etc.). In any case, it would be a pointless expansion of the grammar to have one set of rules for possessives and another for genitive -a. Moreover, it can be shown that when Kiswahili speakers, for reasons of emphasis, etc., are led to ignore the usual word order by allowing material to intervene between a possessive and its noun within a noun phrase, the possessive agreement patterns just like genitive -a [cf. sentence in (28)].

[10]I will also ignore certain variations in adjective agreement with nouns of (traditional) Noun Classes 11 and 14. Some speakers use u- instead of m- on some adjectives in some positions with some Class 11 or 14 nouns in some speech styles. This kind of stylistic variation requires separate, special treatment.

[11]Not all ideolects will incorporate this class.

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Chin-W. Kim

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DEDICATION

This special issue of

Studies in the Linguistic Sciences

in Korean Linguistics

is dedicated to the memory of

Jong-Chul Park

a junior in Linguistics

Seoul National University, Korea

who died on January 14, 1987

defending his belief in

democracy for Korea

TABLE OF CONTENTS

PREFACE

This special issue of SLS consists of papers written by "family" members of the Department of Linguistics at the University of Illinois: faculty, students (post MA), graduates with the Ph.D., and visiting scholars who came for a year or more. Originally, the papers grew out of a seminar on Korean phonology and morphology which I taught in the Spring, 1986. The volume was expanded to include members of the "extended" family.

Korean linguistics in the U.S. has come a long way from early days when only a handful of scholars devoted their research efforts to this area (e.g., Profs. Samuel E. Martin, Fred Lukoff). Since I organized the first international symposium in Korean linguistics in 1977 at the University of Hawaii in conjunction with the Linguistic Society of America Summer Institute, the field has grown in leaps and bounds. There are now meetings and conferences almost every year (e.g., International Circle of Korean Linguistics biennial meetings, Harvard workshops, panels at the meetings of the American Oriental Society and the Association for Asian Studies). Not only are an increasing number of Korean students majoring in linguistics across the country, but an increasing number of American linguists are joining in the study of Korean, a language which I once facetiously characterized as the language of demigods because of its enormous complexity (and, accordingly, enormous difficulty to learn as a foreign language) from anaphora to zeugma and from phonetics to pragmatics. This complexity is of course a rich source for investigations into the nature of language itself, not just into Korean, and I hope that this volume presents a small contribution toward that end.

The major editing of the volume was done while I spent a year at the University of Hawaii, 1986-87. At a distance, this job would have been impossible without the help of Mr. Hyoung-Youb Kim who put the text onto diskettes, and Ms. Yeon-Hee Choi who proofread and checked format. Their assistance is gratefully acknowledged. Also, I would like to thank Professor Byron W. Bender, Chair of Linguistics at Hawaii, who made it possible for me to have the time to complete the editing in mid-February.

This volume is dedicated to the memory of Jong-Chul Park, a junior in Linguistics at Seoul National University, who died in January, 1987, while undergoing police interrogation because of his activities on behalf of the advancement of democracy in Korea.

Chin-W. Kim
Editor

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ON THE NATURE OF h IN KOREAN

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This paper shows how non-linear CV phonology explains two interesting aspects of h in Korean: contraction of h for aspiration and h-deletion. I first claim that a double mapping of h and a neighboring obstruent to a C slot in CV tier produces aspiration and an obstruent mapped to two C slots in CV tier causes an optional phonetic representation. Second, I show that irregularity of h-final predicates is triggered by a different underlying representation of the stem-final h: verb stem-final h has its C slot in CV tier but the adjective stem-final h is floating without its own C slot. Moreover, I claim that the loss of a vowel by casual ɨ-deletion triggers compensatory lengthening of a neighboring vowel, while the loss of the vowel ɨ by obligatory ɨ-deletion does not.

In Korean phonology, h functions as the weakest consonant along with the glides y and w. The weak nature of h is revealed in two areas, contraction of h for aspiration and h-deletion. This paper is addressed to these two areas by showing how satisfactory a non-linear approach is in explaining these aspects of h. For this goal, I will use the frameworks of CV phonology by Clements & Keyser (1983) as well as lexical phonology by Kiparsky (1982) and Mohanan (1982).

First of all, it is well known that there are three degrees of aspiration in Korean underlyingly: (slightly aspirated) plain consonants like p, t, s, c, k, unaspirated (tense) consonants like p', t', s', c', k', and (heavily) aspirated consonants like p^h, t^h, c^h, k^h. These aspiration differences are linguistically significant because they change the meanings of morphemes completely, e.g., pul `fire', p'ul `horn', p^hul `grass'. Besides these underlyingly aspirated consonants, however, plain consonants become aspirated when they occur adjacent to h (Choi 1937; Huh 1968). Within a framework of generative phonology, B-G. Lee (1976) formulated a rule of aspiration as follows:

(1) Aspiration(Mirror image)

$$\begin{bmatrix}+\text{obstr}\\-\text{cont}\end{bmatrix}_1 , [-\text{segment}]_2 , h_3 \rightarrow \begin{bmatrix}1\\+\text{asp}\end{bmatrix} \quad 2 \quad \begin{bmatrix}3\\\#\end{bmatrix}$$

He claims that when /p,t,c,k/ meet an h separated by the boundary "+" or "#", they become aspirated and /h/ is eliminated as in (2):

(2) a. /cap + hi/ —> [cap^{h}i] `to be held'
`to hold' Passive

/ip # hak/ —> [ip^{h}ak] `entrance to school'
`entrance' `school'

b. /manh + ta/ --> [mant^{h}a] `much'
`much' Declarative

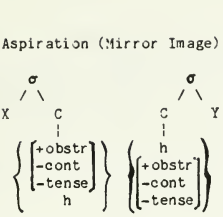
c. /coh + ta/ --> [cot^{h}a] `good'
`good'

More recently, C-G. Kim (1985:14) proposed a glide contraction rule by which h along with other glides causes a contraction when preceded by a non-sonorant consonant:

(3) $$C \quad \begin{Bmatrix}\#\\h\\y\\w\\\eta\end{Bmatrix}_1 \rightarrow \begin{Bmatrix}C_1^h\\C_1^y\\C_1^w\\C_1^{\eta}\end{Bmatrix}_2 \quad \#$$

However, we have to note that there are alternative phonetic representations used in slow and careful speech which cannot be covered by the traditional linear rule formulations (1) and (3): cap+hi [capp^{h}i], ip#hak [ipp^{h}ak], coh+ta [cott^{h}a]. In order to explain this optional process, we need a non-linear rule formulation by manipulating the independent CV tier in addition to the segmental tier.

(4) Aspiration (Mirror Image)

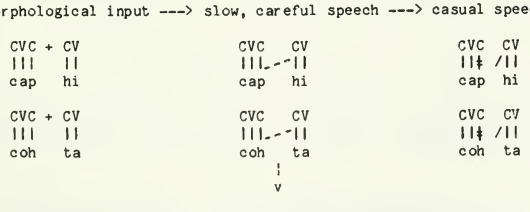


(When a syllable-final plain stop and syllable-initial h sequence or the opposite sequence occurs, the syllable-final segment is associated to the next onset C slot.)

This non-linear aspiration rule indicates that two segments are allowed to be mapped to a single C slot like C , yielding an aspirated consonant as

expected by other analyses.[1] Moreover, it provides a way to explain two possible phonetic representations as illustrated in (5) where we retain the association line between C slot and the nonnasal plain stop in slow careful speech, while the association line is dissociated in casual speech.[2]

(5) Morphological input ---> slow, careful speech ---> casual speech



As we have seen so far, the non-linear CV approach can explain the aspiration process satisfactorily in a predictable way. The other nature of h, i.e., deletion of h, however, does not seem to be predictable because certain cases of h are uniformly deleted, whereas others are optionally deleted intervocalically. Thus a certain class of h-final predicates in Korean has been called "irregular" traditionally (Choi 1937). Recently, however, it is claimed that there is no irregularity in the h-final

conjugation since a stem-final h is uniformly deleted in intervocalic environments (C-W. Kim 1972; Kim-Renaud 1973, 1975).

For the h-deletion phenomenon, to which h-irregular conjugation is related, I argue that there are two different kinds of h-deletion rules.[3] First, there is a post-lexical surface rule which applies in fast or informal careless speech. As this process is related to the formality of speech, this post-lexical rule is not applied in a formal situation as I show in (5) with parentheses. Due to the post-lexicality of the rule, it applies to both non-derived and derived environments whenever the condition is met. It thus also applies beyond the word level.

(6) a. ahop /ahop/ [aop] (or [ahop]) `nine'
kyohwan /kyohwan/ [kyowan] (or [kyohwan]) `exchange'

b. i hanɨl /i#hanɨl/ [ianɨl] (or [ihanɨl]) `this sky'
`this' `sky'

il-ɨl ha /il+ɨl#ha/ [irɨra] (or [irɨlha]) `to do work'
`work' OBJ. `to do'

Here, following Kim-Renaud (1975), I also assume that the deletion of h is processed via the voiced [h]. Then, this positional h-deletion is stated as follows because no phonological process intervenes between h --> ɦ and ɦ --> ∅ (Kim-Renaud 1975).

(7) Intersonorant h-deletion (optional)

h --> ∅ / [+son] ___ [-cons]

As the positionality of this rule is governed by the degree of formality in speech, we can hear [h] in careful speech.

On the other hand, there is another h-deletion phenomenon which is often called "h-irregular conjugation". It behaves quite differently from the optional post-lexical h-deletion process. Kim-Renaud (1975:47-49) demonstrated that when a verb-final h (which means predicate-final in this paper) is preceded or followed by a or ə in intervocalic position, it is obligatorily deleted as in /nah-ɨna/ [naɨna] `bears but' and /co:h-əto/ [co:ado] `is good but'. She thus presented the following rule for her Verb Stem-Final h-deletion employing a boundary approach.

(8) Verb Stem-Final h-Deletion

h --> ∅ / [+voice] ____ & V
Condition: obligatory if h is preceded or followed by a or ə, optional otherwise.

There are, however, some examples which show that the stem final h is obligatorily deleted before affixes beginning with m, n, or l, as in /nolah-ni/ [norani] `(since it is) yellow'. In this case she needed another h-deletion rule (9).

(9) Affix-Final h-Deletion [minor Rule]

h --> ∅ / V _____ & [-cons]

In this paper, however, I will combine (8) and (9) into one rule since both of them deal with affixational h-deletion. Therefore, within the framework of lexical phonology, I will make the following lexical rule for affixational h-deletion which applies in both inflection and derivation.

(10) Affixational h-Deletion (obligatory)

h --> ∅ / V _____]$_{V}$ [+son]
ADJ

(e.g. [[noh] i] --> [noi] `to be located' : derivation
`to locate' Passive

[[noh] ɬni] --> [noɬni] `since (we) locate (it)':inflection)
`since'

As often claimed (Kim-Renaud 1974; Ahn 1985), p, t, and s-irregular conjugations are triggered by the long stem vowel in the underlying representation. However, unlike the other rules of irregular conjugation, h-deletion applies regardless of the vowel length of the stem.

(11) tah - ɬni /ta:hɬni/ [taɬni] `because (we) reach'
t'ah - ɬni /t'ahɬni/ [t'aɬni] `because (we) braid'

As we saw earlier in (8) and (9), Kim-Renaud relied on boundary symbols in rule formulation. In my rule fromulation (10), however, there is no need for boundary symbols because those symbols are encoded as a single bracket and the necessary morphological information can be obtained from the lexicon (Kiparsky 1982, 1983; Mohanan 1982). Nevertheless, this rule is still not satisfactory because of the examples in (12), in which the affix-initial ɬ is deleted only in (12b):

(12) a. /nah/ - /ɬni/ [naɬni] `because (it) produces'
`since'
(cf. /nah/ - /ta/ [nat^{h}a] `produces')
DECL
/nəh/ - /ɬni/ [nəɬni] `because (it) inserts'

/ta:h/ - /+ni/ [ta+ni] `because (it) reaches'
/p'ah/ - /+ni/ [p'a+ni] `because (it) grinds'
/c'ih/ - /+ni/ [c'i+ni] `because (it) pounds'

b. /p^{h}alah/ - /+ni/ [p^{h}arani] (*[p^{h}ara+ni]) `because (it) is blue'
/p'alkah/ - /+ni/ [p'algani] (*[p'alga+ni]) `because (it) is red'
/ma:lagh/ - /+ni/ [ma:lgani] (*[ma:lga+ni]) `because (it) is transparent'
/nop^{h}talah/ - /+ni/ [nopt'arani] (*[nopt'ara+ni]) `because (it) is high'

In explanation, Kim-Renaud claimed that those instances in (12b) are historically derived from the combination of "stem + adjectival affix" as follows:

(13) /p'alkah/ < /p'alk-əh/ `to be red'
/nop^{h}talah/ < /nop^{h}-talah/ `to be high'

Based on this derivation she claimed that both -əh (-ah after vowel harmony) and -talah are adjectival affixes attached to morphemes which are already adjectives. She then argued that /-əh/ and /-talah/ must be marked [+ Affix Final h-Deletion] so that the rule applies in those cases. This proposal, however, brings the following problems. First, we have to allow two rules (8) and (9) for one lexical affixational h-deletion as Kim-Renaud proposed. Second, we have to allow abstract underlying representations for all adjectives. Even if Kim-Renaud's underlying representations can be supported by historical data, they never appear on the surface synchronically and are not perceived as real among native speakers. Finally, we have to mark every abstract adjectival affix as [+Rule (9)]. For example, whenever we meet a new adjective like /tonk+lah/ `to be round' in (12b), we have to reanalyze it in order to mark the affix as [+Rule (9)]. But this marking is a burden to the grammar.

As the abstract underlying representation for an adjectival affix never appears on the surface, we have to recognize the unanalyzed form as the underlying representation. Therefore, I claim that these examples in (12a) and (12b) differ in underlying representation for h due to the grammatical difference between the two cases, i.e., those in (12a) are verbs, while those in (12b) are adjectives. Thus I will posit the underlying representations of the two cases non-linearly as follows:

(14) a. verbs: CVC
| | |
nah

b. adjectives: C VCCV
| | | |
p'alkah

In other words, the final segment h in a verb is associated to its C slot, while the final h- in an adjective does not have its own C slot underlyingly. Therefore, the affixational h-deletion (10) is revised as

(15) Affixational h-Deletion

$$\begin{array}{l} \langle C\rangle \dashrightarrow / \ / \ V \_\_\_\_ \ ]_{\langle V\rangle}^{ADJ} \ [X_{[+son]} \\ \ \ | \qquad\qquad\qquad\qquad\qquad\quad | \\ \ \ h \qquad\qquad\qquad\qquad\qquad\quad \end{array} \qquad (X = \text{either C or V})$$

Here, in addition to this non-linear h-deletion rule, we need to introduce the obligatory ɨ-deletion rule in order to derive the correct results in (12b). As discussed in detail in Ahn (1985b), there are several types of ɨ-deletion process and in order to distinguish this ɨ-deletion process from others, I will call this "(obligatory) General ɨ-deletion" rule.

(16) General ɨ-Deletion: Mirror Image (obligatory)

$$V \dashrightarrow / \ \% \ X \ \underset{\langle \sigma \quad \sigma \rangle}{\underline{\quad | \quad | \quad}} \ ]_{-N\ \langle p/c\rangle}[\ V$$

(X = either C or V
p/c = passive or causative affix
-N = all grammatical categories except noun)

(If a passive/causative affix is attached to an ɨ-final stem, the stem should be multi-syllabic.)

As specified in the rule formulation, if an ɨ-final predicate stem is followed by a vowel-initial passive/causative affix, the stem should be multi-syllabic as shown in (17):

(17) [[ka] +ni] --> [kani] `because (it) goes' `to go' `because'

[[camkɨ] i] --> [camgi] `to be locked' `to lock' Passive

(cf. [[s'ɨ] i] --> [s'ɨi] `to be used' `to use'

As was shown in (11), General ɨ-deletion is a lexical rule which applies only in the lexicon, not beyond the word level. On the other hand, it applies only to inflection and derivation, not to compounding.

In addition to obligatory ɨ-deletion, there is another ɨ-deletion rule which is a post-lexical surface rule. And, because it does not apply to formal or careful speech, it is an optional rule.

(18) Casual ɨ-Deletion (optional):Mirror Image

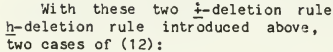
(ɨ is truncated when it meets another vowel and the remaining vowel is lengthened.)

With these two ɨ-deletion rules as well as the new affixational h-deletion rule introduced above, I will display the derivations of two cases of (12):

(19) a.

b.

Inflection



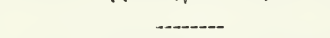
Rule (15)

Rule (15)

[naɨni] [p^{h}arani]

Phonetic representation (by l -> r)

----------post-lexical(optional)----------



Rule (18)

[na:ni]

Phonetic representation

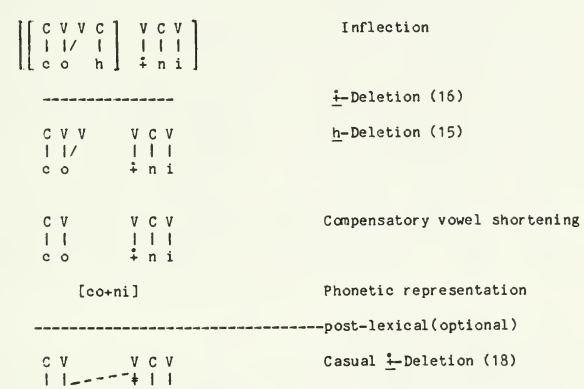
By the rule ordering relations among the three rules, the correct derivations are obtained. By the obligatory ɨ-deletion (16), the affix initial V drops out after a V slot in (19b). Here the existence of the

segment final h does not block the application of ɨ-deletion because rule (15) applies by referring to the existence of a preceding V slot, not a preceding segment. In (19a), however, the existence of a C in the CV tier blocks the application of rule (16). Moreover, we can see that general ɨ-deletion does not cause vowel lengthening in (19b) as P-K. Lee (1979) claims, while casual ɨ-deletion can induce vowel lengthening in (19a).

There is, however, one more problem I have to deal with. Kim-Renaud (1975:50) regards coh- 'to be good' as regular because older generations do not drop the stem final h before a vowel-initial suffix. For example, we can allow three derivations [cohɨni], [coɨni], and [co:ni] from coh-ɨni

`because it is good'. However, I will claim that the possible existence of h between two vowels only shows the existence of a C slot for h in CV tier. In other words, although coh- is categorized as an adjective, the underlying representation of this adjective has a C slot for h. Moreover, considering that coh- has a long vowel underlyingly, I will claim that the optionality of h-deletion (15) is caused by an attempt to avoid too much sonority in the surface form, a VVV sequence in the CV template:

(20)



Once again, we see that the loss of a segment by the obligatory ɨ-deletion rule does not cause compensatory vowel lengthening, while the optional casual ɨ-deletion rule can revive the vowel length. In displaying more derivations of h-irregular conjugation below, I will claim that, like Casual ɨ-deletion (18) but unlike General ɨ-deletion (16), glide formation can also cause compensatory vowel lengthening.

As we can see below, the stem-final h, the least sonorant and most unstable consonant, drops out between two vowels to produce [noa]. Here we can apply glide formation in order to break a vowel hiatus. Thus o changes to w, which is associated to the C slot, and the empty V slot is associated to the vowel a, which derives [nwa:]:

(21) [[C V C] V]^{5} `locate'
[[n o h] A] Inflection

C V C V Vowel harmony & h -> ø (rule (15))
n o h a
ø

C V V [noa]
n o a

C V V Glide formation & Vowel lengthening
n o a [nwa:]
w

In (21), I derived [nwa:] from /noh-A/ by Glide formation and Vowel lengthening, but we can get only [coa], not *[cwa:] from the underlying /ce:h-A/ `good'. This problem can be explained in turn by assuming a different underlying representation, i.e., a different vowel length:

(22) [[C V V C] V] `good'
[c o h] A

C V V C V Vowel harmony
c o h a

C V V V h -> ø
c o a

---------- Glide formation *[cwa:]

C V V Compensatory V shortening [coa]
c o a (simplification of a VVV sequence)

As we see, glide formation applies to a V V sequence, but not to a true
geminate V V, as was suggested by Kenstowicz (1982), as in the example
V V -> C V `come'. Moreover, it precedes the compensatory vowel shortening
o a w a

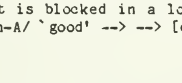
so that we do not get the undesirable *[cwa:].

Consequently, my non-linear approach does not have to allow two different h-deletion rules for one affixational h-deletion process. Moreover, it does not invoke an abstract underlying representation which never appears on the surface. Furthermore, it provides a natural explanation for several related issues such as ɨ-deletion phenomena and compensatory vowel lengthening. Therefore, to sum up the discussion on the h-deletion in conjugation so far, I have proposed a threefold claim. First, adjectives and verbs have different underlying representation which differ from each other in the CV tier. An adjectival h, unlike a verbal h, is a floating segment, without a C slot in the CV tier. Thus, only h-final adjectives undergo obligatory ɨ-deletion, which occurs before or after a vowel, since ɨ-deletion applies after the final V of the CV tier instead of the segmental tier. Second, loss of a segment by General (obligatory) ɨ-deletion does not cause compensatory vowel lengthening as was often claimed, whereas Casual (optional) ɨ-deletion revives the vowel length. Third, unlike obligatory ɨ-deletion, glide formation causes compensatory vowel lengthening, and compensatory vowel lengthening applies to a short vowel but is blocked in a long vowel (e.g., /noh-A/ `release'--> [nwa:], but /co:h-A/ `good' --> --> [coa] not *[cwa:]).

NOTES

*I would like to thank Chin-W. Kim for his helpful comments on the earlier version of this paper. Yale romanization is used in this paper for the transliteration of proper nouns and titles of the references published in Korean, except for certain proper nouns and names of authors already using a different romanization system.

[1]This type of double mapping of two segments to one C slot is not an unusual language-paritcular phenomenon applying only in Korean. Wright (1984) also shows a similar case "d-effect" in Navajo, where she shows that Navajo allows the mapping of two segments to a possible C position at the prefix-stem boundary, not only yielding affricates as expected by previous proposals, but also yielding apparent single fused consonants whose output is determined by a feature hierarchy.



`breathe' --> [didziih] (3rd. sing. imperfect) (the underlined doublylinked consonant is a possible surface affricate)

[2]The aspiration rule does not apply in certain cases as pointed out by C-G. Kim(1985):[[hiɨth]$_V$ to]$_N$ --> *[hiɨtʰo], but [hiɨt'o] `ㅌ (a Korean letter)' (cf. [[noh]$_V$ ko]$_N$ --> [nokʰo] `put'), also [[suh]$_N$ [cepi]$_N$] --> *[sucʰebi], but [suc'ebi] (cf. [[suh]$_N$ [pəl]$_N$] --> [supəl]).

Moreover, application of the aspiration rule can be optional in certain dialects. Especially in Cen-la area, it does not apply in many cases: pəp + hak [pəbak] `study of law'(cf. [pəp^{h}ak] in Standard Korean).

[3]There were also historical h > ø changes in nouns. K-M. Lee(1978: 153) claims that h-final nouns appeared to be unstable in the literature of the 15th century. For example, the stem-final h-deletion did not apply very frequently as in hanəlh-i --> [hanərhi] or [hanəri]. In Modern `sky' Subj.
Korean, most nouns which had fial h do not retain this segment in their underlying representations. For example, the noun `sky' in Modern Korean is han+l after historical vowel changes. There are, however, several nouns which still retain h, although in their underlying representations only. This h does not appear as an individual form or before a vowel, but it appears before an obstruent orthographically as well as phonetically by aspirating the following consonant.

an-pak' /anh-pak'/ [anp^{h}ak] `in and out'
`in' `out'

məli-kalak /məlih-kalak/ [mərik^{h}arak] `hair'
`hair' `stick'

Here I assume that the final h is floating without its own C slot in the CV template because general +-deletion formulated as (16) in this paper applies to these examples as it does to h-final adjectives (I discuss the h-final predicates soon in this paper). Moreover, if any of these nouns has a vowel immediately before h, it takes -ka instead of -i as its subject marker, just as other vowel final nouns take -ka as the subject marker. I will display two derivations to support my claim.

a. [C V C V / m ə l i h] [C V C V C / k a l a k] ---> [mərik^{h}arak] by aspiration

b. [C V C V / m l i h] [V C V / + l o] --> C V C V C V --> C V C V C V --> [mərirо]
m ə l i h l o m ə l i l o
+-deletion h-deletion

[4]See Ahn(1985a: 112-139) for detailed discussion.

[5]As described in Ahn (1985a), the underspecified A in an A-initial suffix becomes ə or a according to vowel harmony.

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TAG QUESTIONS IN KOREAN: FORM AND FUNCTION

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In this paper I attempt to explicate the speech acts of the Korean tag questions with focus on their interaction with syntax and prosody. In Section 2, I set up two types of question tags; namely (1) negative tags and (2) prosentential tags. I then contrast negative tag questions with negative interrogative sentences and move on to the prosentential tag questions. In Section 3, I examine intonational features of the tag questions. In Section 4, I look into the speech acts of the tag questions from the perspective of illocutionary acts. Finally, I will present Speech Act Statements for the Korean tag questions.

1. Introduction

One of the common grammatical devices by which we modify the illocutionary force of an utterance is the use of a `tag' attached to the end of a sentence. I will use the term `tag' in a broad sense to mean any post-sentential element, including even an intonationnl element.[1] By a tag question I mean an interrogative sentence consisting of two parts: the main body, which I will call the pack, and the question tag. The question tag is an optional part. So the pack alone can form an independent sentence without the question tag.

2. Types of Korean Tag Questions

I would like to propose to set up two types of tag questions in Korean on the basis of their form negative tag questions and prosentential tag questions. Let us look into them one by one.

The negative tag question (NTQ) and the negative interrogative (NI) sentence are syntactically nondistinct in the present-tense (that is, untensed) form. They are formally distinct only in tensed sentences.[2] The NTQ and NI sentences are schematically shown below.

	Pack	Tag
(1) Negative TQ	[s...(TENSE).ci]	NEG-ha (*TENSE)
(2) Negative Interrogative	[s...(*TENSE).ci]	NEG-ha (TENSE)

Consider now the illustrative examples in (3), where the two types of questions are contrasted.

(3) a. Pi ka wa. ss. ci an. ha? (NTQ; *NI)
rain NOM come PAST suppose NEG do/be
`It rained, didn't it?/*Didn't it rain?'

b. Pi ka o. ci an. ha. ss. e? (NI; *NTQ)
come suppose NEG do/be PAST INITIMATE
`Didn't it rain?/*It rained, didn't it?'

c. Pi ka o. ci an. ha? (NTQ; NI)
`Isn't it raining?/It's raining, isn't it?'

d. *Pi ka wa. ss. ci an.ha.ss.e? (*NTQ;*NI)
PAST PAST

In (3a) the past tense is marked in the pack and the tag is tenseless. Here we have only the tag question reading. The standard negative interrogative reading is blocked, as indicated in the English translation. In (3b), contrary to (3a), the pack is tenseless and the past tense is marked in the negative ending. Here we get only the normal negative question reading; a tag question reading is blocked, as shown again in the English translation. The sentence in (3c) is tenseless. So it is ambiguous between the two readings of a tag question and a standard negative question. In (3d) the past tense appears twice--once in the pack and once in the tag. It is simply ill-formed.

Let us consider another set of examples involving copulative sentences such as those in (4), where the distinction between the tag question and the negative interrogative is more evident.

(4) a. Mia ka pancang i. ess. ci an. ha? (NTQ; *NI)
NOM leader be PAST NEG do/be
`Mia was the leader, wasn't she?/*Wasn't Mia the leader?'

b. Mia ka pancang i. ani. ess. e? (NI; *NTQ)
be NEG be PAST INT
`Wasn't Mia the leader?'

c. Mia ka pancang i. ci an. ha? (NTQ; *NI)
be NEG do/be
`Mia is the leader, isn't she?/*Isn't Mia the leader?'

d. *Mia ka pancang i. ess. ci an. ass. e? (*NI; *NTQ)
be PAST NEG PAST INT

e. *Mia ka pancang i. ci. an. ass. e? (*SNQ; *NTQ)
be PAST

f. *Mia ka pancang i. ani. ya? (N1; *NTQ)
Mia NOM leader be NEG be INT
`Isn't Mia the leader?'

As was in the sentences in (3), the negative tag in the copulative sentences in (4) is always tenseless (cf. (4a, c)). Note also that in the copulative sentences the form NEG+Copula i is used rather than the form Copula i+ci+NEG+ha as shown in (4b.f).

The form of the negative tag question is invariably an.ha? (not-do?) in the intimate speech level.[3] The negative question tag cannot be tensed as shown in (4b,d), whereas the pack can be either tensed or tenseless as in (3a,c). By contrast, in the negative interrogative sentence tense cannot be marked in the pack, as shown n (4a,d); it can be marked only in the tag, as in (4b). The negative tag in Korean is formally similar to the French n'est ce Pas?, which is also invariably[4] used regardless of the tense or the positive/negative polarity of the pack. Sentences in (5) show the way in which the negative tag is used in both negative and positive sentences.

(5) a. Pi ka wa. ss. ci an. ha? (=2a)
rain NOM come PAST suppose NEG do
`It rained, didn't it?'

b. Pi ka o. ci an. ha. ss. ci an. ha?
rain NOM NEG do PAST suppose NEG do
`It didn't rain, did it?'

Notice that in (5b) the suppositive ci and the negative an each appear twice. Here, the negative tag is attached to the suppositive sentence in (6)

(6) Pi ka o. ci an. ha. ss. ci
rain NOM NEG do PAST suppose
`It didn't rain, I suppose.'

I will now turn to the form of the prosentential tag questions. I would like to set up two subtypes on the basis of their form: (a) an- kulay (< an.kule.ha.e `so-be/do') and (b) kulehci ( < kule.ha.ci `so be/do'). For ease of reference I will call them PSTQ-I and PSTQ-2, respectively. The positive counterpart of PSTQ-1, that is, kulay (< kule. ha.e `so-be/do') is also used as a tag but not as a question tag. It is more like an interjection in that it may well occur in sentence-initial position, as shown in (7).

(7) a. Pi ka wa. ss. e, kul.ay?
so-be/do
`Did it rain, then?'

b. Kul.ay, pi ka wa. ss. e?
so-be/do
`So, did it rain?'

The negative counterpart of PSTQ-2, that is, ankulehci (< an.kule. ha ci `not-so-be/so-suppose'), unlike PSTQ-2, cannot be used as a tag, as indicated in the ill-formed sentences of (8).

(8) a. *Pi ka (an) wa.ss.e an.kule.h.ci?
b. *Pi ka (an) wa.ss.ci an.kule.h.ci?

Consider now some examples of prosentential TQs in (9).

(9) a. PSTQ-1
Pi ka wa. ss. ci an. kul. ay?
PAST suppose NEG so be/do INT
(Roughly) `I suppose it rained, didn't it?'

b. PSTQ-2
Pi ka wa. ss. ci kule. h. ci?
so be/do suppose
(Roughly) `I suppose it rained, didn't it?'

The prosentential question tags can also be attached to the pack, which ends in the assertive e, as given in (10), as well as to the pack ending in the suppositive ci in (9).

(10) a. PSTQ-I
Pi ka wa. ss. e an. kul. ay?
INT NEG so be/do INT
(Roughly) `It rained, didn't it?'

b. Pi ka wa. ss. e kule. h. ci?
INT so be/do suppose
(Roughly) `It rained, didn't it?'

As a contrastive feature of the two tag questions, it may be noted that in the negative TQ no element gets inserted between the pack and tag, whereas in the prosentential TQ particles like the polite marker yo can occur between them. See examples in (11).

(11) a. Pi ka wa. ss. ci (*yo) an. ha? (Negative TQ)
POL

b. Pi ka wa. ss. ci (yo) an. kul. ay (yo)? (PSTQ-1)
kuleh. ci (yo)? (PSTQ-2)

The tense in the prosentential tag is normally present, regardless of the tense of the pack. As a marked case, however, it can be identical to that of the pack. Consider now sentenses in (12) in contrast to those in (13).

(12) a. Pi ka wa.ss.ci an.kul.ay? (Unmarked Case)
PAST PRESENT
`I suppose it rained, didn't it?'

b. Pi ka o.ci an.kul.ay? (Unmarked Case)
PRESENT PRESENT
`I suppose it's raining, isn't it?'

c. Pi ka o.keyss.ci an.kul.ay? (Unmarked Case)
FUTURE PRESENT
`I suppose it will rain, won't it?'

(13) a. Pi ka wa.ss.ci ankul.ay.ss.e? (Marked Case)
PAST PAST
`I suppose it rained, didn't it?'

b. Pi ka o.keyss.ci an.kule.h.keyss.e? (Marked Case)
FUTURE FUTURE
`I suppose it will rain, won't it?'

I will now move on to the intonational features of the tag questions.

3. Terminal Contours of Tag Questions

In the negative TQ no pause is allowed at the boundary of the pack and the tag; by contrast, the prosentential TQ allows a pause between them. And Three terminal contours (TCs) may be recognized as a first approximation: high (H), mid(M), and low(L).

(14) Pi ka wa.ss.ci (*#) an.ha? (Negative TQ)

(15) a. Pi ka wa.ss.ci--M an.kul.ay/kule.h.ci? (PSTQ-1/2)
/H
\L

b. Pi ka wa.ss.e--M an.kul.ay/kule.h.ci?
/H
\L

The terminal contours at the end of the question tags also vary, depending on the type of tag questions. The negative TQ has either high (H) or mid (M) contour; the prosentential TQ has only a high contour, as shown in (14).

(16) a. Pi ka wa.ss.ci an.ha--M (Negative TQ)
/H

b. Pi ka wa.ss.ci/e an.kul.ay (PSTQ-1)
/H
kule.h.ci (PSTQ-2)

When we put (13) and (14) together, we will have intonational contours of tag questions shown in (17).

(17) a. Pi ka wa.ss.ci an.ha--M (Negative TB)
/H

b. Pi ka wa.ss.ci--M an.ku.lay/kule.ci (PSTQ-1/2)
/H /H
\L

The prosodic patterns I have examined cursorily may be rendered to the corresponding punctuational devices in writing. The negative TQ which has no pause or juncture between pack and tag may be given no punctuation mark, which is in accord with the current practice in writing. The prosentential TQs with high, mid and low contours between pack and tag may be marked with a question mark (?), a comma (,) and a period (.) between them, respectively. If the prosentential TQ is marked with a question mark or a period in writing, it is regarded traditionally as consisting of two sentences. Only in the case of the comma (that is, mid level) intonation, the whole utterance is regarded as a single sentence consisting of a pack and a tag. In this case, the comma can be dropped altogether, thus allowing no pause in between. Now the intonation-marked tag quesrions in (17) are rendered to the punctuation marked writing in (18).

(18) a. Pi ka wass.ci an.ha? (cf. 17a-H)

b. Pi ka wass.ci an.ha. (cf. 1?a-M)

c. Pi ka wass.ci/e? an.kul.ay/kule.h.ci? (cf. 17b-H)

d. Pi ka wass.ci/e(,) an.kul.ay/kule.h.ci? (cf. 17bM)

e. Pi ka wass.ci/e. An.kul.ay/Kule.h.ci? (cf. 17b-L)

Another puncutational convention I would like to introduce at this point is the use of a dash (--) at the boundary of the pack and tag. Obviously it has the effect of obliterating the intonational distinction noted at the boundary of the pack and tag. It is shown in (19).

(19) Pi ka wass.ci-ankul.ay/kule.h.ci?

4. Speech Acts of the Tag Questions

We are now ready to go on to the speech acts of the tag questions. In contrast to the neutral information-seeking speech act of a yes-no question--neutral in the sense that the speaker is not biased as to the truth/falsity of the proposition expressed in the question, the speech act of a tag question is that a speaker seeking a confirmation or an agreement as to the truth of the proposition asserted or supposed in the pack. The speech act of the negative yes-no question has also the property of seeking a confirmation/agreement in addition to the normal illocutionary act of seeking information. The speech act of the prototypical tag question is now analyzed as that of conjoining two types of illocutionary acts--an assertive/suppositive and a requestive, in that order. The second conjunct of the requestive has an embedded illocutionary act of confirming/assenting. The prototypical speech act of the tag questions is now stated in the form given in (20), which I will call Speech Act Statement (SAS).

(20) Speech Act Statement (SAS): proto-TQ

In uttering `U', which expresses p in the form of a TQ, SUPPOSES/ ASSERTS p and (STRONGLY) REQUESTS that H (STRONGLY) CONFIRM/ASSENT that p.

The SAS of the proto-tag question (20) is now subject to adjustment so as to fit into the variety of tag questions we have discussed so far. This will be done by fixing the illocutionary act types represented in the illocutionary act verb pairs in (20): either SUPPOSE or ASSERT, and either (STRONGLY) CONFIRM or (STRONGLY) AGREE. Notice that in the second pair the matter of variation in strength is also indicated. Those illocutionary act verbs ASSERT, SUPPOSE, CONFIRM, ASSENT and REQUEST stand for the illocutionary act types--respectively, assertives, suppositives, confirmatives, assentives and requestives--those classified and characterized by Bach and Harnish (1979). Let me elaborate a little on their taxonomy and characterization of illoctionary acts, as a digression.

According to them, assertives, suppositives, confirmatives and assentives belong to the same illocutionary act type, namely the constative. Their constatives and directives correspond to Austin's (1962) expositives and exercitives and Searle's (1975) representatives and directives, respectively. A constative is an expression of the speaker's belief and an expression of his intention that the hearer form a similar belief.[5]

Now consider our SAS in (20) and think of some ways in which we can fix each illocutionary act type in it. First, think of the pack of a TQ. It ends either in the suppositive ci or the assertive e and these endings elicit either suppositive or assertive act, when used sentence finally without any tag.[6] So we can assign SUPPOSE to the first conjunct if the pack ends in ci and assign ASSERT if it ends in e. Next, let us look into the intonational contours of the tag. They have to do with the illocutionary act of the second conjunct in our proto SAS in (20). The rising terminal contour at the tag elicits a question or a request for information, confirmation, agreement, or the like. And it seems to be a universal way of eliciting an oral response from the hearer. So we assign REQUEST to the second conjunct. But how can we tell whether the request is a request for confirmation or a requeust for assent? In the case of a negative TQ, which has a rising or level contour at the tag, it seems that the rising contour elicits a confirmation-seeking act rather than an agreement seeking one. It may be generalized to the prosentenial TQs as well. Furthermore, the degree of rising, together with other vocal qualities like shouting and whispering or fast and slow speech, seems to indicate variations in strength of confirmation. The non-rising contour of the negative TQ seems to elicit a request for assent, rather than a request for confirmation.

Let us now turn on to the two prosentential TQs: PSTQ-1, an.kul.ay? and PSTQ-2, kule.h.ci? These prosentential forms can be used without a pack. In isolation, the tag of PSTQ-1 conveys a force of request for confirmation and the tag of PSTQ-2 a force of request for assent. These tags can be attached, as we saw in (10), to the pack ending in either e or ci. So, in the PSTQs, the form of the pack, the e- or ci- pack, determines the illocutionary act of the first conjunct of the SAS, that is, an assertion or a supposition, and the form of the tag determines the illocutionary act of the second conjunct, that is, request for confirmation or for assent. Furthermore, when contrasted to the negative TQs, the PSTQs seem to convey strong request on the scale of the force of request.

Let us now look into the intonational contours at the boundary of the pack and tag. The three levels of TCs, which we assumed to be related with the punctuational devices, must now be examined in terms of illocutionary acts. Now the question is: are there three levels of terminal contours distinguishable in terms of their role in speech acts? It seems that only two levels can be motivated: high and non-ligh. First of all, the terminal contour at the boundary of a PSTQ has no illocutionary role for the first conjunct of the SAS. They bring about variations in strength of the illocutionary act in the second conjunct; the high TC elicits a request for strong confirmation in tbe case of a PSTQ-1, and a request for strong assent in the case of a PSTQ-2. The mid and low TCs we set up earlier would not seem to play any role distinct from each other. The two would rather be collapsed, and I would treat the merged one as the unmarked TC

with variation in strength, as contrtasted to the marked high TC. Together with these intonational variations, other vocal qualities such as stress, shouting, whispering, etc. regulate variations in strength of request, confirmation and assent. It can be stated in our SAS as REQUEST (STRONGLY), CONFIRM (STRONGLY), and ASSENT (STRONGLY).

6. Conclusion

In summary I will present those formally distinct Korean tag questons in (21) and their Speech Act Statements in (22).

(21) a. NTQ

/H (i)
Pi ka wa.ss.ci an.ha?—M (ii)

b. PSTQ-1

/H /H (iii)
Pi ka wa.ss.ci—M an.kul.ay (iv)

/H
Pi ka wa.ss.e—M an.kul.ay? (v)

c. PSTQ-2

/H /H (vi)
Pi ka wa.ss.ci—M kule.h.ci? (vii)

/H
Pi ka wa.ss.e—M kule.h.ch? (viii)

(22) Speech Act Statments: TQs

a. In uttering `U', which is in the form of an NTQ (with high TC), S SUPPOSES a proposition p and REQUESTS that H CONFIRM that p. (=21i)
b. In uttering `U', which is in the form of a PSTQ-1 (with mid TC), S SUPPOSES a proposition p and REQUESTS that H ASSENT that p. (=21ii)
c. In uttering `U', which is in the form of a PSTQ-1 (with ci-pack and high-TC), S SUPPOSES a proposition p and STRONGLY REQUESTS that H STRONGLY CONFIRM that p. (=21iii)
d. In uttering `U', which is in the form of a PSTQ-1 (with ci-pack and mid-TC), S SUPPOSES a proposition p and STRONGLY REQUESTS that H CONFIRM that p. (=21iv)
e. In uttering `U', which is in the form of a PSTQ-1 (with e-pack and mid-TC), S ASSERTS a proposition p and STRONGLY REQUESTS that H CONFITM that p. (=21v)
f. In uttering `U', which is in the form of a PSTQ-2 (with ci-pack

and high-TC), S SUPPOSES a proposition p and STRONGLY REQUEST that H STRONGLY ASSENT that p. (=21vi)

g. In uttering `U', which is in the form of a PSTQ-2(with ci-pack and mid-TC), S SUPPOSES a proposition p and REQUESTS that H ASSENT that p. (=21vii)

h. In uttering `U', which is in the form of a PSTQ-2 (with e-pack and mid-TC), S ASSERTS a proposition p and REQUESTS that H ASSENT that p. (=21viii)

NOTES

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[1]As an example of the taxonomy of tags, see Bolinger's (1957: 17-8):

(a) Auxiliary tags: Find them, did he? It's raining, isn't it?
(b) Tentations: He will, I suppose?
(c) Imputations: They will attend to it later, you say?
(d) Explications: How does he like it, I wonder?
(e) Intonation tags: Says, he is sorry, eh?

[2]In Korean there are two syntactically distinct negative constructions: (1) V/A--ci--NEG, (2) NEG--V/A. It is the first form that we are concerned with in contrast to the tag question. For discussion of the synonymy/nonsynonymy of the two negatives, which has long been a controversy among the generative grammarians, see Im (1973), H. Lee(1970, 1972), K. Lee (1979), Oh (1971, 1978), and Song (1973, 1977, 1979).

[3]Of the intimate speech level is the one used between the friendly equals or by the speaker talking to his junior/inferior on informal occasions. Its sentence ending is typically e. This is the least marked speech level in Korean in that the polite marker yo is attachable to this level.

[4]Matching patterns of English tag questions are reported in (a version of) Australian English (Cattel 1973: 615-6):

(i) Harry: ... Claude is rich.
John: Claude is rich, is he?/*Claude is rich, isn't he?
(ii) John drank beer, did he?
(iii) Did John drink beer, did he?

[5]Characterizations of those illocutionary acts we are concerned with are shown below for further reference (Bach and Harnish 1979:42-7). Some subtypes of constatives:

a. Assertives
In uttering e, Speaker S asserts proposition P if S expresses:
i. the belief in that P, and
ii. the intention that Hearer H believe that P.
b. Suppositives
In uttering e, S supposes P if S expresses:
i. the belief that it is worth considering the consequences of P, and
ii. the intention that H believe that it is worth considering the consequences of P.
c. Confirmatives
In uttering e, S confirms P if S expresses:
i. the belief in that P, based on some truth seeking procedure, and
ii. the intention that H believe that P because S has support for P.
d. Assentives
In uttering e, S assent to the claim for P if S expresses:
i. the belief in that P, as claimed by H (or as otherwise under discussion), and
ii. the intention (perhaps already fulfilled) that H believe that P
e. Requestives (a subtype of directives)
In uttering e, requests H to do act A if S expresses:
i. the desire that H do A, and
ii. the intention that H do A because (at least partly) of S's desire.

[6]For discussion of the suppositive particle ci, see Chang (1972).

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ON THE MORPHOLOGY OF MORPHOLOGICAL CAUSATIVE VERBS IN KOREAN: AN ARGUMENT AGAINST LIEBER'S MORPHEME-BASED LEXICON

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This paper claims that word formation with Causative Suffixes in Korean has been fossilized. To support this claim, I present two types of empirical evidence:(1) the variants of Korean causative suffixes i, hi, ki, u, chu, etc. are not phonologically conditioned; and (2) the causative suffixes are not semantically transparent. On the basis of this, I argue that morphological causative verbs in Korean must be listed in the lexicon instead of being derived via word formation rule (cf. Aronoff 1976) and that Lieber's (1980) model of the lexicon is inadequate, which lists affixes and lexical items in the lexicon that cannot be decomposed into further constituents.

I. Introduction

There are a number of verbs in Korean which are structurally analyzable as stem plus suffix as in (1)[1]. The suffixes i, hi, ki, li, etc. have been called causative suffixes and those verbs containing one of the suffixes called derived causative verbs. Let us call these causative affixes Irregular Causative Affixes (henceforth ICA)[2].

(1) mek -i -ta `feed'
eat DEC
ilk -hi -ta `cause someone to read'
read
us -ki -ta `cause someone to laugh'
laugh
sal -li -ta `make someone alive'
live
nʧc -chu-ta `slow down'
be late
sos -ku -ta `make soar'
soar
pi -u -ta `make something empty'
be empty

In terms of structure, the causative suffix is added to verb, and the word formation process shows systematic relations in meaning and in syntax. Roughly speaking, the meaning of the ICA form, i.e. morphological causative verb is `cause someone/thing to do or Adjective'. The syntactic relation between the two classes of words connected by the suffixation process

appears to be that the (in)direct object of the ICA verb corresponds to the subject of the corresponding input verb:

(2) a. Mary -ka Fred -lɨl us-ki-ess-ta.
SUBJ DO laugh-CAUS-PAST-DEC
`Mary made Fred to laugh.'

b. Fred -ka us-ess-ta.
SUBJ laugh-PAST-DEC
`Fred laughed.'

(3) a. emma -ka Fred -eke sakwa -lɨl mek-i-ess-ta.
mother SUBJ IO apple DO eat-CAUS-PAST-DEC
`Mother fed Fred with apple.'

b. Fred -ka sakwa -lɨl mek-ess-ta.
SUBJ apple DO eat-PAST-DEC
`Fred ate an apple.'

This way of structural and functional analysis of the above verbs assumes that they are derived via Word Formation Rule à la the Word Formation approach, especially Lieber's (1980) model of the lexicon which lists affixes and lexical items that cannot be analyzed into constituent parts in the permanent lexicon and which derives existing and potential complex items by means of a structure-building rule, combining lexical items drawn from the permanent lexicon. In other words, those morphological causative verbs containing one of the ICAs do not have lexical entries in the lexicon under Lieber's framework. Y-S. Kim's (1984) work on the morphological causative verbs in Korean actually takes this position (Kim's study will be examined in section II.).

This paper, however, argues against deriving the morphological causative verbs by word formation rule. Even if the constituent analysis of the causative verbs is possible, I argue from the synchronic point of view that any verb in which one of the ICAs is included is listed in the lexicon, following Wolff (1984) which lists all and only lexical items "for which the relationship between sound and meaning is synchronically arbitrary and which can participate in productive lexical processes" (Wolff 1984:5). This criterion for listing lexical items in the lexicon assumes that word formation rules are employed either when new words are made by applying to new items when they are introduced into the language or when potential complex items are derived, which are both structurally and semantically compositional (Aronoff 1976 and Wolff 1984). For example, when the word Mao was introduced into English, the word formation process -ist in English was applied to the borrowed word and the new word Maoist entered into English. Another different word formation process belonging to the latter case is the formation of -ing nominalizations in English. The -ing form in English is not listed in the lexicon because this word formation process is applicable to all of its potential domain, i.e. verb[3]. However, the word transmission (of a car) and words such as length, width, mirth, and truth, which are formed from adjectives, are listed in the lexicon because either they have acquired its idiosyncratic meaning

which is not compositional or the relevant morphological process is quite limited even though they are structurally analyzable.

The empirical evidence for the argument that morphological causative verbs in Korean must be listed in the lexicon rather than being derived by word formation rule will be sought in the phonological and semantic aspects of the morphological causative verbs; I will show that the variants of ICAs in Korean are not phonologically conditioned and that ICAs are not semantically transparent. This will lead us to the conclusion that ICAs in Korean are on the verge of death as lexical items participating in a synchronically productive morphological process. In other words, the ICAs morphological process is fossilized and, therefore, those morphological causative verbs containing one of the ICAs are regarded as lexicalized items to be listed in the lexicon.

I will first examine one previous study on the morphology of causative verbs in question, which was done within Lieber's (1980) framework, and will try to argue that deriving morphological causative verbs in Korean is inadequate. After proposing an alternative, I will provide empirical evidence in section IV to support my argument that morphological causative verbs must be listed in the lexicon. This will be followed by a brief discussion on the theoretical implication of this study. From now on, for the sake of reference, let us call those verbs containing one of ICAs Morphological Causative Verbs (henceforth, MCV).

II. Against Lieber's Framework

The purpose of this section is not to review Lieber's (1980) framework of the lexicon, but to show that her framework is inadequate as far as the data of Korean MCVs are concerned. For this purpose, I will examine Kim's (1984) study which takes the position that MCVs in Korean are derived, adopting Lieber's model of the lexicon listing both derivational and inflectional affixes and lexical items in the permanent lexicon which cannot be decomposed into further constituents, e.g. long, not length. As a consequence, under Lieber's framework, actual and possible complex lexical items are produced by a word formation rule, i.e. a single context-free rewrite rule which generates unlabelled binary branching tree structure into which terminal lexical items are inserted according to their lexical subcategorization restriction such as Adjective, [+Latinate], etc.

Since there are various forms of causative suffix, Kim formulates the following morpholexical rules to represent the relatedness of the variants i, hi, ki, u, hu, and ku listed in the permanent lexicon:

(4) Kim's (66) X+i ~ X+hi ~ X+ki

(70-71) X+hu ~ X+ku ~ X+u

Before proceeding with the main discussion, let me reformulate Kim's morpholexical rules because they are not appropriately formulated.

According to Lieber's concept of morpholexical rule, it is "a relation defined between pairs of lexical items which are listed in the permanent lexicon" (1980:39). Therefore, the Kim's morpholexical rule above assumes that there are, for example, such monomorphemic lexical items as mek, meki, mekhi, and mekki which represent the same meaning when we substitute X with the item mek `eat'. However, as every native speaker of Korean would agree, there are no such allomorphs but mek having the semantic content `eat' in Korean.

Following Kim's intention, therefore, I formulate the following morpholexical rules for the ICAs, i, hi, ki, li, chu, ku, u, and iu:

(5) a. X ~ hX ~ kX ~ lX

b. X ~ chX ~ kX ~ iX

Under Lieber's model of the lexicon, the variants of the ICA would be listed in the lexicon as follows:

(6) Category Class: Affix
Lexical Class 1 morpholexical rule (5a)
(i, hi, ki, li) phonological rep.
semantic rep.: CAUSE
subcategoriza-
tion:]v____]v
.
.
.

2 morpholexical rule (5b)
(u, chu, ku, iu) phonological rep.
semantic rep.: CAUSE
subcategoriza-
tion:]v____]v
.
.
.

As the subcategorization property of the ICA's lexical entries shows, the ICA has to be attached to verb(stem). But, there is one idiosyncratic property of ICAs in terms of phonological shape, which is that not all variants could be attached to any verb because the variants of ICAs are not free variations. To solve this problem, Kim introduces Allomorphy Selection Rules (ASR). For the lexical items under lexical class 1, he states the following ASRs:[4]

(7) a. ki appears after a nasal or the segment s.
b. hi appears after a lenis stop (p, t, c, k) that has the potentiality to become aspirated.
c. i-elsewhere

But, the ASR (7) cannot predict all the cases of the ICA's affixation process relevant to the lexical class 1, as Kim also notices; for example, *math-hi(-ta) (math-ki `leave something in charge of someone') and *cuk-hi(-ta) (cuk-i `kill') constitute counterexamples to the rule (7). Therefore, the ASR (7) fails to attain the level of descriptive adequacy.

Moreover, when we consider the fact that the variants u, chu, ku, and iu are not in complementary distribution with the variants i, hi, ku, and li, another problem arises: To provide appropriate affixation processes for the variants u, chu, ku, and iu, another sort of ASR has to be formulated. As a consequence, unmotivated lexical features have to be introduced in the lexicon of modern Korean. For instance, if we call (7) Type 1 ASR, then every lexical entry of monomorphemic verbs listed in the permanent lexicon has to contain the information concerning proper affixation process; which verb should follow which type of ASR.

This way of handling the idiosyncratic property of the ICAs may appear to be an elegant solution for the affixation processes of ICAs. However, this solution has to pay the cost of ad hocity, using synchronically unmotivated diacritics/lexical features. In addition, in order to handle those counterexamples, e.g. *cuk-hi to the above ASRs, this approach of deriving MCVs in Korean via word formation rule has to invent more unmotivated lexical features.

In fact, even if unlimited numbers of unmotivated lexical features are allowed to be used in Lieber's model of the lexicon, it would eventually fail to assign lexical features to every verb because the variants of ICAs in Korean are not phonologically conditioned as we will see in the next section. For instance, given the following two lexical items, memchu(-ta) `stop' and nuk(-ta) `be soft/wet', what would be the possible corresponding causative verbs formed by ICA word formation? Would they be memchu-i(-ta) and nuk-i(ta), or memchu-u(-ta) and nuk-hi(-ta), respectively? I will leave the question to those who subscribe to Lieber's model of the lexicon.

Now, I would like to present an alternative in the following section.

III. Proposal and Assumptions

The alternative I propose is to list all of the lexical items containing one of the ICAs in the lexicon instead of deriving them by means of word formation rule. However, this does not mean that I follow the lexical entry approach. For the argument that Korean MCVs must be listed in the lexicon, I would like to argue that the causative suffixes in Korean do not participate in the synchronically productive word formation process as independent lexical items by showing that the affixation process of ICAs is not phonologically conditioned and that a number of putative causative verbs are no longer causative verbs because they have already lost the meaning `CAUSE' which is supposed to be projected from the causative suffix included in those MCVs. That is, ICAs are semantically opaque in modern Korean.

To put it from the perspective of the productivity[5] of word formation

process, since the variants of the ICA in Korean are on the way of widespread phonological distortion and are no longer semantically transparent, the ICA word formation is regarded as being fossilized in the lexicon of modern Korean even though there are a number of existing MCVs which could be recognized as word formation by speakers of Korean. Therefore, those verbs containing one of the ICAs are considered to be lexicalized items and, so, must be listed in the lexicon.

Before presenting evidence for my argument, let me briefly introduce the presumed model of the lexicon this study takes.

As for the structure/organization of the lexicon, I follow Lieber's model of the lexicon; the lexicon consists of the permanent lexicon and rule component/lexical structure. Also, I assume that affixes are listed in the lexicon. However, for the criterion listing lexical items in the permanent lexicon, I follow Wolff (1984):

> All and only those lexical items are listed in the lexicon for which the relationship between sound and meaning is synchronically arbitrary and which can participate in productive lexical processes ((Wolff 1984:5) Emphasis is mine.).

Contrary to Lieber, this listing criterion allows even polymorphemic forms to be listed in the lexicon if and only if they meet the above condition. For example, the morphologically complex lexical item poki `example' in Korean, which is composed of the monomorphemic verb po `see' and the action nominal affix ki, is to be listed in the lexicon because the noun has acquired its own idiosyncratic meaning `example'. On the other hand, the complex item poki `action of seeing' is to be derived by word formation rule, e.g. Lieber's type of context free structure building rule which combines the verb po and the action nominal suffix ki drawn from the lexicon into the complex item poki `action of seeing'. This is because the formation of -ki in the language is not only applicable to all of its potential domain, verb, but also because the lexical meaning of the -ki nominalization form is compositional.

As Wolff convincingly argues, this listing criterion frees the lexicon from Lieber's semantic projection rules because it lists those polymorphemic items whose meaning is not calculatable compositionally. This listing criterion also affects the function of word formation rule: Word formation rule is employed for making new words and for deriving possible complex lexical items which are both structurally and semantically compositional.

In what follows, I will present phonological and semantic evidence in order to support the argument that ICA word formation in Korean is so fossilized that every existing MCV in the language should be listed in the lexicon.

IV. Phonological and Semantic Evidence

C-W. Kim (1973:140-141) and Bak (1982) try to show that the affixation of ICAs is phonologically conditioned by positing /hi/ as an underlying morpheme for the causative variants, i, ki, li, u, chu, etc. In the first part of this section, however, I argue against their analysis and show that the variants of the causative suffix are not phonologically conditioned. To achieve this goal, however, I am not going to go over all the cases because it suffices to cite a couple of cases to show that the variants of the ICA are not phonologically conditioned.

Let us first see how Bak deals with the cases in which the ICA is phonetically realized as [i]. For these cases, he represents the following underlying forms:

(8) a. /po-hi-ta/ [poida] `show'
/nu-hi-ta/ [nuida] `get to defecate'

b. /mek-hi-ta/ [megida] `feed'
/cuk-hi-ta/ [cugida] `kill'

To explain the phenomenon in (8a), Bak sets up the following h-Deletion rule:

(9) h-Deletion

h ----> ∅ / [+voiced] (+) _____ [-cons]

To support his argument that the variant i is derived from the morpheme /hi/, Bak says that the above h-Deletion rule is a very productive rule in Korean phonology, citing some data which undergo h-Deletion:

(10) /kihan/ [kian] ~ [kihan] `term'
/manhi/ [mani] ~ [manhi] `many'

As the data (8a) and (10) show, however, they are not the same sort of phenomenon. Whereas the h-Deletion rule (9) must be obligatory in (8a), it should be optional in (10). Therefore, the data in (10) lose their ground as supporting data for Bak's argument. In Korean, since h-Deletion rule as a productive rule applies optionally, Bak has to set up another obligatory h-Deletion rule which applies only to the data in (8a). Then the obligatory h-Deletion rule is regarded as being neither phonologically nor morphologically motivated, but lexically motivated because the range of data to which the obligatory h-Deletion rule is supposed to apply is confined to only those MCVs in which the causative suffix i is preceded by a voiced segment. Therefore, Bak's h-Deletion rule is considered to be ad hoc as a phonological rule.

Concerning the data (8b), Bak posits another h-Deletion rule below as a minor rule to be lexically marked for the verbs in (8b):

(11) h-Deletion (minor)

$$h \longrightarrow \emptyset \;/\; k + \_\_\_\_\_ \;]_{causative}$$

As far as the rule (11) is concerned, it is very hard to call it a rule, because it is made to account for a very limited number of morphological causative verbs.

The above discussion makes it clear that the variants of the ICA, hi and i are not phonologically conditioned . Moreover, another empirical evidence showing that all of the variants of Korean causative suffixes are not phonologically conditioned is the following fact; when native speakers of Korean are asked to make possible morphological causative forms of certain words, for example, memchu(-ta) `stop' and nuk(-ta) `be soft', no uniform response is elicited. This is surprising because if variants of the ICA are phonologically conditioned and, therefore, there are relevant phonological rules internalized in the native speakers of Korean, the produced forms should be identical among speakers. However, forms produced by my informants did not appear to be identical.

I think the above arguments are enough to show that variants of ICAs are not phonologically conditioned. But, let us take one more case concerning the phonology of causative affix l because even Kim (1984), who expresses a doubt about phonological relatedness of the variants of ICAs, tries to derive the variant l via phonological rules.[6]

To account for the data (12) below,

(12) /sal-hi-ta/ [sallida] `save (life)'
/mul-hi-ta/ [mullida] `get to pay (tax)'

Bak sets up the following l-Gemination rule which makes the segment l geminated in intervocalic position:

(13) l-Gemination

$$l \longrightarrow ll \;/\; [+syl]\ (+)\_\_\_\_\_\ [+syl]$$

As the following derivation of the form /sal-hi-ta/ shows, Bak's l-Gemination rule accounts for the data (12) correctly:

(14) /sal-hi-ta/ Underlying Form
/sal- i-ta/ h-Deletion rule
/sall-i-da/ l-Gemination rule and Intervocalic voicing
[sallida]

However, Bak's (and Kim's) l-Gemination rule fails to derive correct phonetic forms of the following morphological causative verbs in which l-Gemination does not take place even though they meet the structural description of l-Gemination rule (13).

(15) a. /tal-hi-ta/ [talguda] *[tallida] `heat (metal)'
/il-hi-ta/ [ilguda] *[illida] `raise (topsoil)'

b. /cul-hi-ta/ [curida] *[cullida] `shorten'
/t‡l-hi-ta/ [t‡rida] *[t‡llida] `let in'

As for data like (15a) in which the segment h changes into k (before voicing), Bak posits a weird rule called `Velarization rule' as in (16):

(16) Velarization rule

$$h \longrightarrow k \;/\; \left[\begin{array}{l}\text{nasal}\\ s\end{array}\right] (+) \_\_\_\_\_$$

However, as we can see, this rule does not apply when the segment h is preceded by the segment l. If Bak expands the structural condition of the Velarization rule (16) to prevent those counterexamples in (15a), then a crucial problem arises; the application of his h-Deletion rule, which deletes h when it is preceded by a voiced segment, must be again lexically restricted in order to make it not apply to the data in (15a). This would be another ad hocity.

For the data (15b), repeated below, the following Liquid-Weakening rule is set up by Bak, which changes the segment l to r between a vowel and a vowel or a glide:

(15) b. /cul-hi-ta/ [curida] *[cullida] `shorten'
/t‡l-hi-ta/ [t‡lida] *[t‡llda] `let in'

(17) Liquid-Weakening[7]

$$l \longrightarrow r \;/\; [+syl] \_\_\_\_\_ (+) [-cons]$$

However, after h-Deletion applies to the form /cul-hi-ta/, the resulting form cul-i-ta satisfies structural descriptions of both Liquid-Weakening rule (17) and l-Gemination rule (13). The only way to

block the application of the l-Gemination rule to the intermediate form cul-i-ta is to restrict lexically the range of the application of l-Gemination rule (13) or that of Liquid-Weakening rule (17). What this means is that the causative suffix form li also is not phonologically conditioned.

Summing up, it is hopeless to derive the variants of ICAs from the morpheme /hi/ or anything else via phonological rules unless ad hoc pseudo-rules are invented. That is, the above discussion shows that ICAs are not phonologically conditioned. From the perspective of morphology, the phenomenon that the variants of ICAs are not phonologically conditioned indicates that causative suffixes in Korean are frozen as part of the morphological causative verbs.

In the rest of this section, to support the claim that causative suffixes in Korean are fossilized as part of MCVs, I will present semantic evidence showing that a few of MCVs are no longer causative verbs because they do not carry the meaning `CAUSE' as should be expected from ICAs included in those verbs. That is, ICAs are not semantically transparent.

Before looking at which MCVs have lost the meaning `CAUSE', let us see the primitive semantic structure of causative verb. For the semantic/conceptual structure of causative, Jackendoff (1983) proposes the following structure:

(18) $\begin{bmatrix} & \text{CAUSE} & \text{X} & \text{Y} \\ \text{event} & & (\text{ thing }) & (\text{ event }) \end{bmatrix}$

This semantic structure of causative shows that causation brings another event. To put it differently, causative situation involves two different events; one event is a causer's activity on a causee; another event is what the causer brings about. From the perspective of lexicalization, the event Y brought by X would be realized as either one argument or a clause. In English, for example, the causative construction `I caused him to die' is the case that the event Y is lexicalized into a clause. On the other hand, the causative sentence `I killed him' shows that the event Y is lexicalized into a single NP.

For the causative constructions like `I caused him to go', it is easy to decide whether or not the verb cause has the semantic property `CAUSE'. But, for the verbs like paint in the causative construction `I painted the floor', it is not always crystal clear whether or not they carry the meaning `CAUSE'.

Peterson (1985) provides a device to test whether a verb is a causative or not in an agentive sentence: For a verb to be a causative verb in an agentive sentence, somethings (events) in `the agent of something (event)' and `the agent in something' must be different because causation involves two different events/situations. For example, in the sentence `I painted the floor', the agent I is the agent in painting the floor and also the agent I is the agent of the paint getting on the floor. This shows that the somethings `painting the floor' and `the paint getting on the floor'

are two different events. Therefore, the lexical item `paint' is a causative verb containing the meaning `CAUSE'. However, the verb `throw' in the agentive sentence `I threw the book' is not a causative verb because somethings appear not to be two different events as follows: I is the agent in throwing the book and I is the agent of the book being thrown.

Being equipped with this device, let us now proceed to examine some morphological causative verbs in Korean. The first MCV to be examined is the verb pes-ki-ta `to take off'. If we apply Peterson's agentive relationship to the verb pes-ki-ta in the agentive sentence (19), we get the following information: Fred is the agent in taking John's clothes off and Fred is the agent of John's clothes being taken off.

(19) Fred-ka John-ɨy os -ɨl pes -ki-ess-ta.
SUBJ POSS clothes DO take off CAUS-PAST-DEC
`Fred took John's clothes off.'

The somethings `taking John's clothes off' and `John's clothes being taken off' are not two different events which constitute one of the basic characteristics of the semantic structure of causatives. Therefore, the morphological causative verb pes-ki-ta fails to be a causative verb even if it contains the causative affix ki.

That the lexical item peskita has undergone a semantic change is reflected in the argument structure of the verb. As we saw before, if a causative affix is added to a monotransitive verb (direct object, but no indirect object), then the causative of a monotransitive becomes a ditransitive verb (direct object and indirect object):

(20) a. Fred -ka sakwa -lɨl mek-ess-ta.
SUBJ apple DO eat-Past-Dec
`Fred ate an apple.'

b. emma -ka Fred -eke sakwa -lɨl mek-i-ess-ta.
mother SUBJ IO apple DO eat CAUS-Past-Dec
`Mother fed Fred with an apple.'
`Mother caused Fred to eat an apple.'

However, as (21) shows, the MCV pes-ki-ta which are formed from the monotransitive verb pes-ta appears not to be a ditransitive having both direct and indirect object:

(21) a. John -i os -ɨl pes-ess-ta.
SUBJ clothes DO take off-PAST-DEC
`John took his clothes off.'

b. Fred-ka John-ɨy os -ɨl pes-ki-ess-ta.
SUBJ POSS clothes DO take off-CAUSE-PAST-DEC
`Fred took John's clothes off.'

b. *Fred -ka John -eke os-ɨl pes-ki-ess-ta.
SUBJ IO clothes-DO take off-CAUS-PAST-DEC

That is, instead of having a ditransitive argument structure, the MCV pes-ki-ta has a monotransitive argument structure as does its corresponding verb pes-ta.

Then, what is the lexical meaning of the MCV pes-ki-ta? From the perspective of semantic structure, those two verbs, pes-ta and pes-ki-ta have the following same semantic structure:

(22) [Take Off X Y
event (thing) (thing)]

The only semantic difference between those two verbs lies in the internal content of the argument Y; in the case of the verb pes-ta, Y must be a thing attached to X; on the other hand, in the case of the MCV pes-ki-ta, Y should be a thing attached to something/someone else. The following two sentences illustrate this difference. In (23a) whose verb is the MCV pes-ki-ta, the thing cangkap `glove' taken off by Fred is the one put on someone else, not on Fred in the real world. On the other hand, in (23b) containing the verb pes-ta, the thing `glove' taken off by Fred is the one put on Fred, not on someone else.

(23) a. Fred-ka cangkap-ɨl pes-ki-ess-ta.
SUBJ glove-DO take off-CAUS-PAST-DEC
`Fred took (someone's) gloves off.'

b. Fred-ka cangkap-ɨl pes-ess-ta.
SUBJ glove-DO take off-PAST-DEC
`Fred took his (Fred) gloves off.'

As I have shown so far, since the MCV pes-ki-ta has undergone a semantic change, losing the semantic property of the causative suffix ki, synchronically it would be no longer legitimate to call it a causative verb. Therefore, the causative suffix ki is no longer semantically transparent.

Let us see another interesting case. The morphological causative verb phi-u-ta `smoke' appears not to be a causative verb in the agentive sentence (24) below as shown in the following: Fred is the agent in smoking a cigarette and Fred is the agent of a cigarette being smoked.

(24) Fred-ka tampay-lɨl phi -u-ess-ta.
cigarette burn -CAUS-PAST-DEC
`Fred smoked a cigarette.'

Considering a cross linguistic fact that in a morphologically formed monotransitive causative sentence, the object, i.e. the causee appears as a subject in its corresponding intransitive sentence (cf. Comrie 1976), we should expect to have (24)'s corresponding sentence in which the object tampay `cigarette' in (24) appears as the subject, if the sentence (24) is a real morphological causative construction. Contrary to our expectation, however, (24)'s corresponding intransitive sentence appears to be ungrammatical as (25) shows. This syntactic phenomenon reflects the semantic change occurred in the MCV phi-u-ta.

(25) *tampay-ka phi-ess-ta.
cigarette-SUBJ burn-PAST-DEC

The above semantic and syntactic phenomena indicate that the verb phi-u-ta `smoke' containing the causative affix u has gained its own idyosyncratic meaning in its life time as well as losing the semantic property of the causative affix `CAUSE'. That is, the relationship between sound and meaning that the MCV phi-u-ta `smoke' represents is synchronically arbitrary. On the basis of this, I argue that those verbs pes-ki-ta and phi-u-ta are simplex lexical items, not complex items, from the synchronic point of view.

The above semantic phenomena provide empirical evidence for the argument that causative affixes in Korean are semantically opaque. Here are some verbs belonging to these cases.

(26) mac-chu-ta `hit (the mark)' cha-iu-ta `fasten'
kam-ki-ta `shampoo (hair)' pis-ki-ta `comb'

To sum up, I have shown in this section that the variants of ICAs are not phonologically conditioned and that ICAs are no longer semantically transparent as lexical items carrying the meaning `CAUSE'. This supports the claim that the word formation involving ICA is so fossilized that the morphological causative verbs containing one of the ICAs are regarded as lexicalized items to be listed in in the lexicon.

The above phonological and semantic phenomena concerning ICAs also tell us that ICAs are on the verge of death as independent morphemes participating in synchronically productive morphological processes.

V. For Two Types of Lexical Rules in the Lexicon

Since I have argued that every MCV is listed in the lexicon, the following question arises: How is the lexical relatedness between monomorphemic forms and their corresponding causative forms, which are structurally and semantically compositional, captured in the lexicon? To put it differently, if we take the lexicon as a formal representation of a speaker's knowledge of the lexical units of his language, then the lexicon

must represent Korean speakers' linguistic knowledge relating monomorphemic items to their corresponding complex items containing one of the ICAs, even though the word formation with ICAs is passively recognized.

With regard to the above question, I propose that this kind of lexical relatedness in the lexicon be represented by means of Lexical Redundancy Rule (Jackendoff 1975). Its theoretical result is to allow both Redundancy Rule and Word Formation Rule as two types of lexical rules, attributing unique functions to each lexical rule: Lexical redundancy rule is employed to state relatedness between lexical items listed in the lexicon and Word Formation Rule to produce new words and possible complex lexical items. To put it somewhat differently, Lexical Redundancy Rule provides keys to the analysis of existing forms and Word Formation Rule serves as the basis for producing new and possible complex items. In terms of the organization of the lexicon, Redundancy Rule would constitute part of the permanent lexicon[8] while Word Formation Rule would form part of lexical structure, to borrow Lieber's terminology.

Within the generative studies of the lexicon, Lexical Redundancy Rule and Word Formation Rule have been two competing lexical rules. Recently, probably since Aronoff (1976), Redundancy Rule has been under attack from the Word Formation approach for its being static and metalinguistic characters. Wolff (1984) reproaches Lexical Redundancy Rule as follows:

> The conception of lexical rules as redundancy rules flies in the face of a theory of grammar that seeks to be a representation of speaker's linguistic, rather than metalinguistic, abilities. This position also minimalizes the possibility of lexical creativity (Wolff 1984:6).

However, if the proposed function of redundancy rule (as a key to the analysis of existing forms) is excluded from the lexicon, then the word formation approach would fail to represent the linguistic knowledge of Korean native speakers, not metalinguistic, relating monomorphemic forms to their corresponding lexicalized complex forms. That is, we could not exclude a linguistic possibility that speakers would be able to make a generalization observed in already known related lexical items, e.g. cuk-ta `die' vs cuk-i-ta `kill' and mek-ta `eat' vs mek-i-ta `feed' when they learn two related lexical items.

By allowing both Redundancy Rule and Word Formation Rule as lexical rules in the lexicon, attributing unique functions to each rule, we could make the grammar of the lexicon rich and properly constrained.

VI. Conclusion

In this paper, I have argued that morphological causative verbs in Korean must be listed in the lexicon rather than being derived via word formation rule. For this argument, I showed that the variants of causative suffixes in Korean are not phonologically conditioned and that they are not semantically transparent. On the basis of these two types of evidence, I

claimed that word formation with ICAs is so fossilized and, therefore, the MCVs in modern Korean are lexicalized items.

In section II, I showed that Lieber's model of the lexicon, i.e. morpheme-based lexicon, is empirically inadequate. As far as the issue that what kinds of lexical items must be listed in the lexicon, this study produces empirical evidence for Aronovian framework which lists also complex items as well as simplex items[3] if their word formation process is on the low degree of productivity.

To sum up the result of this study in one sentence, borrowing terminology from lexical phonology, morphological causative verbs in Korean are not derived forms but underived lexical items.

NOTES

*This paper was begun in Fall 1985 as a research paper in Seminar on Phonology and Morphology taught by Professor Chin-W. Kim. The author is grateful to him for comments on an earlier version of this paper.

[1]See Appendix 1 for a list of verbs which form -Causative Affix form. The term `stem' is not used as a theoretical term in this paper.

[2]The following abbreviations and transcription conventions are used throughout this paper:

(A) Abbreviations:

CAUS: causative DEC: declarative DO: direct object
IO: indirect object POSS: possessive SUBJ: subject
ICA: irregular causative affix
MCV: morphological causative verb

(B) Transcription: The transcription of Korean examples is made in Yale romanization system except for the following: u for wu and ɨ for u.

[3]Examples are drawn from Anderson (1985).

[4]In Kim (1984), the causative affix li is treated as a phonological variant of the causative form i. Because of this, Kim's ASR (8) does not include the causative form li. But I argue in section IV that li is not a phonological variant of both i and hi

[5]The issue of how morphological productivity is computed has not been settled in the current literature. Even computing productivity would vary depending on the model of the lexicon (cf. Lieber 1980). However, the term `productivity' of word formation process is used in two senses here; " the extent to which a morphological process applies to the forms" i.e. the input range to which a morphological process applies and "the possibility of applying the process in question to new forms" (Anderson 1985:16-19).

[6]In the case of Kim, instead of /hi/, /i/ is set up as an underlying form for the causative form li. However, the following argument also applies to Kim's case because after the segment h in /hi/ is deleted, the resulting form /i/ is the same as Kim's for other phonological processes such as l-Gemination.

[7]I put the morpheme boundary + on Bak`s original rule.

[8]As is expressed, I assume that lexical rules are inside the lexicon. Wolff (1984), however, argues that the lexical rule component is independent of the lexicon.

[9]In Aronoff (1976), affixes are not listed in the lexicon, but referred to in word formation rules. This paper, however, assumes that affixes are listed in the lexicon, following Lieber (1980).

APPENDIX 1

A list of verbs which form the -Causative Affix form in Korean

*This list is largely based on Bak (1982) and Kim (1984).

/-i/: nok- `melt', nu- `urinate', na- `come out', nop- `be high', po- `see', puth- `stick; catch (fire)', ssek- `rot', sok- `get deceived', cuk- `die', mek- `eat', cul- `get shorten', col- `(water) get dry', cel- `get salted',

/-ki/: an- `hold in arms', kam- `shampoo (hair); close (eyes)', kolm-`fester', pes- `take off', pis- `comb', nam- `remain', olm- `get contaminated', ttɨt- `pluck', kulm- `go hungry', us- `laugh', math- `take charge of', sin- `put on (shoes)', ssis- `wash'

/-hi/: ep- `take on one's back', enc- `place on', ilk- `read', ip- `dress', anc- `sit down', cap- `catch', cac- `simmer down', telep- `be dirty', kut- `be hard' palk- `be light', pulk- `be red', sik- `get cold', mut- `get stained', nup- `lie down'

/-li/: kel- `hang', kolh- `(stomach) remain unfilled; play trick', al- `know', sal- `live', ssɨl- `sweep', ppal- `suck', tol- `turn', mul- `pay', oli- `rise', talh- `wear away', ket- `walk', put- `swell', malɨ- `get dry', hɨlɨ- `flow down; be spilt'

/-u/: phi- `burn', ci- `bear; fall', cci- `grow fat', kki- `hold (between)', pi- `be empty', me- `be clogged', kkae- `awake', sae- `(day) dawn', tot- `rise'

/-iu/: kh+- `be tall', tt+- `float', tep- `be hot', tha- `burn' ca- `sleep', cha- `be full; fasten', se- `stop; stand', ss+- `write'

/-ku/: sos- `soar', tot- `rise: get high', tal- `get hot', il- `rise'

/-chu/: nac- `be low', nic- `be slow', mat- `be hit; fit'

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SOME PROBLEMS OF NP COORDINATION IN KOREAN

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This paper is a descriptive study of the interaction of noun morphology and syntactic coordination in Korean, examining in particular how well the Korean facts fit the multi-headed approach to coordination of Sag et al. (1985), and how the syntax of coordination interacts with noun suffixation. Using phonological diagnostics for word-hood proposed by Sadock (1980), evidence is presented for three distinct types of coordinate structure, one involving suffixation, one involving separate conjunction words reminiscent of English coordination, and one involving no overt conjunct marking. We then examine the interaction of coordination with noun morphology, with special attention to case marking, presenting evidence from this interaction that coordinate structures have the same head-final properties as other phrases in Korean. We argue that with modifications to capture these head-final properties, it is possible to construct an analysis of case affixation without the use of phrasal affixes, in spite of appearances to the contrary. It remains to be seen whether a phrasal affixation analysis can avoid the disadvantages of the non-phrasal analysis.

1. Introduction. The syntax of coordination, the nature of morphological systems, and the interaction of syntactic and morphological principles are areas of considerable theoretical interest in recent years. We believe that Korean, a language with a highly agglutinating flavor, provides a fertile area for research on each of these questions and on their inter-relations. Questions for which Korean may provide a particularly revealing test case include the following:

A. How general is the approach to coordination presented in Sag et al. (1985)? In particular, can coordination schemata and X-bar feature principles be made to interact to provide an adequate account of the Korean data?

B. Are there languages that require "phrasal affixation" of the sort discussed by Sugioka (1984), Fabb (1984), Sadock (1985, 1986), Kendall and Yoon (1986a,b) and others, or can more conventional analyses be constructed, employing general feature inheritance principles to achieve the effect of phrasal affixation? What kinds of data would force a choice between the two approaches?.

Our main goal in this preliminary paper is descriptive, to lay out the phenomena for subsequent theoretical discussion. We explore the interaction of syntactic principles of coordination and morphological principles of suffixation (especially case marking) in Korean noun phrases, attempting an

analysis that does not include phrasal affixation. Our goal in this paper is not to show that a non-phrasal analysis is superior, but to show that it is possible, and to explore some of the principles that such an analysis requires. Coordination in other categories will be discussed only briefly, and phrasal affixation analyses not at all, but both will be covered extensively in work in progress (Cho and Morgan, forthcoming).

The crux of the descriptive problem is to specify what may combine with what in coordinate structure, and to determine how much of this specification is in syntactic terms, and how much in terms of morphological principles, with the main focus being the interaction of NP coordination and case marking. The kind of problem we have in mind is exemplified in examples (1) through (5).

(1) Koyangi-wa sae-wa kae-ka ...
cat-and bird-and dog-nom.
'the cat and the bird and the dog'

(2) *Koyangi-ka-wa sae-ka kae-ka ...

(3) *Koyangi-ka sae-wa kae-ka ...

(4) *Koyangi-ka sae-ka kae-ka ...

(5) Koyangi-ka sae-ka kuriko kae-ka

The descriptive framework we will use is in the spirit of the analyses of coordination given in the theory of Generalized Phrase Structure Grammar (GPSG), though we will deviate in certain ways from the analysis given for English in Gazdar et al. (1985) and Sag et al. (1985). The crucial assumptions we take from that work are these:

a. coordination is 'base-generated', rather than derived by tranformation-like operations.

b. the notion 'head' plays an important role in syntactic theory, in the fashion of work in (some version of) 'X-bar' theory.

c. at least some properties of phrases can be perspicuously represented in terms of syntactic features.

d. feature properties of phrases are projected from properties of their parts by general principles in which the notion 'head' plays a role.

We begin by sketching some general properties of the syntax of Korean, with special attention to the internal structure of major phrase types, and to the syntax of coordination. We then present evidence bearing on the word structure of syntactically coordinate expressions, arguing that there are three distinct types of coordination: one where conjuncts are marked morphologically by word-level suffixes like -wa/kwa, -ina, etc., one where conjuncts are marked syntactically by being combined with conjunction words

like kuriko, and one where there is no overt marker of coordination. We tentatively postulate coordination rules based on this data. In the final section of the paper we explore how these coordination rules interact with morphological rules to account for the facts of coordination. But several problems remain unsolved.

2. Morphology. In this section we sketch some relevant aspects of the morphology, by syntactic category. We restrict our attention to nouns and verbs, but similar morphological properties can be found in other categories.

2.1. Noun morphology. There are a number of noun suffixes that mark various properties, including case, focus, mood, plurality, and quantification. Order of suffixes appears to require setting up several suffix classes.

2.1.1. Some noun suffixes. There are at least five morphemes that could plausibly be analyzed as case suffixes, listed in A. There are doubtless others. We are not concerned here with exhaustive listing, but with providing enough distinct morphemes to uncover morpheme classes.

Distribution of multiple forms for a given case is phonologically determined. Case marking is generally obligatory, though it may be omitted in some syntactic contexts in certain informal styles. As one would expect, the case suffixes are mutually exclusive.[1]

A. Case markers:

Nominative:	-i/-ka
Accusative:	-ul/-rul
Genitive:	-ui
Locative:	-e
Instrumental:	-ro/-uro

In addition, other forms one might reasonably consider case markers are formed by combining the locative with further suffixes, like the forms exemplified in B:

B. Suffixes formed by combining with -e:

Dative:	-eke
In, at:	-eso

This does not exhaust the set of noun suffixes, which is rather large. Some additional examples:

A NP whose referent has discourse focus may be marked by the focus suffix -un/-nun.

The suffix -yo, with a poorly understood discourse function, may also be attached to nouns.

The suffix -tul may be used to mark plural number. The plural marking is generally omitted, but may be obligatory in certain contexts.

Some suffixes have the semantics of quantifiers; for example, the suffix -to, 'also, even', and -ssik, 'each'.

2.1.2. Suffix order. Stating the possible orderings of noun suffixes seems to require separating suffixes into mutual exclusion classes in a way that is to some extent independent of semantic function. The classes are as follows, with representative morphemes for each class:

C. Noun suffix classes:

1. -ssik, 'each'

2. -tul, plural marker

3. -e, locative case
   -ro/uro, instrumental case

4. suffixes that combine with -e: -so, -ke, etc.

5. -i/ka, nominative case
   -(r)ul, accusative case
   -ui, genitive case
   -to, 'even, also'
   -(n)un, focus marker

6. Discourse suffix: -yo

Suffixes in class 5 are mutually exclusive, as are those in 3. In addition, the case markers in 5 may not combine with the suffixes in 3 and 4. Presumably this follows from general principles of case assignment that disallow double case marking.

When multiple suffixes are present, the order must be as in D.

D. Order of noun suffixes, by classes in C:

Stem + 1 + 2 + 3 + 4 + 5 + 6

It is important to note that if we are correct the morphological system requires stipulations of mutual exclusiveness of morphemes. We leave open exactly how such stipulations are to be formalized. It is just the existence of such stipulations that is crucial for our analysis.

2.2 Verb morphology. We give here only a quick sketch of verb morphology, to point out that verbs show a morphological pattern similar to that found in nouns. We restrict our attention here to suffixes that mark aspect, tense, mood, and discourse function. Verbal coordination is discussed more extensively in Cho and Morgan (1987).

Certain verb suffixes are often referred to as 'aspect markers', though their real function might more accurately be described as marking speech level and/or speech act properties like indicative/subjunctive. This class includes -(su)pni and others.

Past tense is marked by -oss, future tense by -kess.

'Mood'--a mixture of discourse and speech act properties--is marked by suffixes like -ta (declarative).

The discourse suffix -yo may also combine with verbs.

E. Simplified list of verb suffix classes:

(1) -oss past tense, -kess future tense

(2) -supni, "aspect" (more likely, speech level)

(3) -ta, -kka, etc.: 'mood'

(4) -yo, discourse suffix

The verb stem may not stand alone as an independent word, but must have minimally tense, aspect and mood marking. Where more than one suffix is present, the order is as in F.

F. Stem + tense + aspect + mood + discourse marker

3. Some relevant aspects of the syntax of Korean. We move now to a quick sketch of the syntax of Korean as it bears on coordination.

3.1. Constituent order. Korean is a strictly head-final language. This is true of all major phrase types, as exemplified in the S and NP examples below:

(6) $[_S\ [_{NP}$ koyangi-ka] $[_{NP}$ kae-rul] $[_V$ ponta]]
the cat-NOM the dog-ACC sees
'The cat sees the dog'

(7) $[_{NP}\ [_{REL}\ [_{NP}$ kae-rul] $[_V$ pon]] $[_N$ koyangi-ka]]
the dog-ACC see-REL the cat-NOM
'The cat that sees the dog'

Except for the head-final requirement, order of sisters within a phrase is relatively free.

3.2. The syntax of coordination. There are three coordination strategies. The first involves kuriko or ttonun combined with phrases, the second involves the use of morphemes like hako, kwa/wa, ko, etc. The third strategy employs no coordination marker. For simplicity's sake we restrict

ourselves here to forms translatable as English and, ignoring analogous constructions translatable as or, etc.

The first strategy involves the word kuriko, which may combine with conjuncts as diagrammed in 8 and illustrated in 9.

(8) a. $[_{XP}$ XP kuriko XP] (binary)

b. $[_{XP}$ XP (kuriko) ... XP kuriko XP] (n-ary)

(9) a. hayan koyangi-ka kuriko pharan kae-ka
'The white cat and the blue dog'

b. koyangi-ka (kuriko) kae-ka kuriko sae-ka
'The cat (and) the dog and the bird'

We will present evidence below that kuriko is an independent word, not an affix.

The second coordination strategy involves, in place of kuriko, coordination suffixes on the head of each conjuncts (except the last), with the form of the suffix varying by syntactic category: hako or kwa/wa (phonologically conditioned) for NP's, ko for other phrase types, as diagrammed in 10 and illustrated in the NP in 11(a) and the VP in 11(b).

(10) a. $[_{NP}$ NP-wa (NP-wa) ... NP]

b. $[_{XP}$ XP-ko (XP-ko) ... XP]

(11) a. Koyangi-wa sae-wa kae-ka
'The cat and the bird and the dog'

b. Kae-rul po-ko talliosta
'Saw the dog and ran'

The third strategy is like the second, except that no coordination marker is present. This type of coordinate structure, diagrammed in 12 and illustrated in 13, has only the and interpretation.[4]

(12) a. $[_{NP}$ NP (NP) ... NP]

b. $[_{XP}$ XP (XP) ... XP]

(13) a. Sae, camcari, pihaenggi-ka cal na-n-ta.
bird dragonfly airplane-NOM well fly-PRES-DECL

b. Sae-ka, camcari-ka, pihaenggi-ka cal na-n-ta.
bird-NOM dragonfly-NOM airplane-NOM

'The bird, dragonfly and airplane fly well.'

c. *Kongbuha ca mok-uro ka-ass-ta
study sleep eat-in order go-PAST-DECL

d. Kongbuha-ro ca-ro mok-uro ka-ass-ta
study-in order sleep-in order eat-in order go-PAST-DECL

'(somebody) went in order to study, sleep and eat.'

4. The morphology of coordination. In the previous section we claimed that an important difference between coordination with -wa/kwa, -hako, -ina, -ko, etc. on the one hand, and kuriko and ttonun on the other hand, is that the former are suffixes on the head N or V, forming a word with it; whereas the latter are separate words, independent constituents in the syntax, just as the Hangul orthography suggests. In this section we present evidence of this difference. We point out differences in word structure between the two types of conjunction, using the following criteria of wordhood, paraphrased from Sadock (1980, 302):

(1) Obligatory sandhi processes operate within words, but are optional or inapplicable between words.

(2) The phonological rules that apply within words are often morphologically or lexically controlled, and can be subject to exceptions and idiosyncracies.

(3) It is impossible to interrupt words with parenthetical material.

4.1. Phonological tests. For the first test--obligatory sandhi--we consider phonological rules of glottalization, voicing and aspiration.

4.1.1. Glottalization. Glottalization is obligatory within a word, but not across word boundaries. If a syllable ends in a consonant (excluding nasals and a lateral) and is followed within the word by a syllable which begins with a consonant, then the initial consonant of the second syllable is glottalized. The rule is exemplified in (14) and (15):

(14) kak-si [kak-s'i] 'bride'

(15) hulk-pyok sa-i [huk-p'yok sa-y] 'chasm of the clay wall'

Notice that (14), clearly a word, undergoes glottalization, in which s is glottalized to s'. But in (15), clearly two words, s of the second word does not undergo glottalization, though p in the first word does.

The glottalization rule treats -kwa and -ko as suffixes, but kuriko as a separate word. Thus, glottalization is obligatory for -kwa if the environment for glottalization is met. On the other hand, glottalization never applies to the initial k of kuriko even if the preceding noun ends in a consonant, creating a consonant cluster which is the environment of glottalization. These facts are illustrated in (16) through (21):

(16) cip-kwa [cipk'wa] *[cipkwa] 'house and'

(17) cikap-kwa [cigapk'wa] *[cigap-kwa] 'purse and'

(18) cip kuriko [cip kurigo] *[cip k'uriko] 'house and'

(19) cikap kuriko [cigap kurigo] *[cikap k'uriko] 'purse and'

(20) cak-ko [cakk'o] *[cakko] 'be small and'

(21) nolp-ko [nopk'o] *[nopko] 'be wide and'

4.1.2. Voicing. Voiced stops occur only between voiced segments. Stops that are unvoiced in word-final position are voiced when followed by a vowel-initial suffix. And in suffixes with initial voiceless stops, if the suffix is combined with a stem whose final segment is voiced, the stop is voiced. This voicing process is obligatory within a word, but applies not at all or only optionally across word boundaries. The rule is exemplified in (22) through (24).

(22) cip-tul [cipt'ul] *[cibt'ul] 'houses'

(23) cip-ul [cibul] *[cipul] 'house-ACC'

(24) salam-tul [saramdul] *[saramtul] 'person-PLURAL'

Voicing distinguishes -kwa/wa and -ko from kuriko in a similar way. Examples (25) through (30) illustrate this.

(25) cuin-kwa [cuingwa] *[cuinkwa] 'host/owner and'

(26) san-kwa [sangwa] *[sankwa] 'the mountain and'

(27) cuin kuriko [cuin kurigo] *[cuin gurigo] 'the owner and'

(28) mol-ko [molgo] *[molko] 'be far and'

(29) ka-ko [kago] *[kako] 'go and'

(30) mol-ta kuriko [molda kurigo] *[molda gurigo] 'be far and'

(31) ka-n-ta kuriko [kanda kurigo] *[kanda gurigo] 'go and'

4.1.2. Aspiration. There is a word-internal rule that aspirates stops that are preceded by /h/. This rule applies to -ko, as shown in (32), indicating that it is a suffix. But in this construction kuriko does not occur in the proper phonological environment for aspiration. Example (33) is not syntactically well-formed; (34) is well-formed, but does not contain the environment for aspiration of kuriko.

(32) norah-ko khu-n [norakho khun] *[norahko khun] 'yellow-and big'

(33) *norah kuriko khun

(34) norah-un kuriko khu-n [noran kurigo khun]

4.2. Lexical idiosyncracy. We might interpret the allomorphy of -kwa/wa as itself evidence that this element is a suffix. The conditioning factor is the final segment of the morpheme preceding the conjunction. If the noun stem ends in a vowel, then -wa must occur; if it ends in a consonant, -kwa, as illustrated in (35) and (36). This kind of allomorphic conditioning is not unusual, we think, between morphemes in a word. It is far less common for such conditioning to occur across word boundaries.

(35) a. koyangi-wa kae-ka 'The cat and the dog'
b. *koyangi-kwa kae-ka

(36) a. haksaeng-kwa sonsaeng-nim-i 'The teacher and the student'
b. *haksaeng-wa sonsaeng-nim-i

4.3. Parentheticals. Generally, a word may not have an internal parenthetical like thullimopsi 'certainly' or amato 'probably', as shown in (35). Using this observation as a test of wordhood, we see that -wa/kwa, -ko, etc. behave as suffixes, whereas kuriko behaves as an independent word. For example, no parenthetical can occur between -wa or -ko and the stem that precedes them, though one can occur after them, as shown in (37) through (39).

(37) a. Amato kae-ka taranassulkosita.
probably dog-NOM ran away (POTENTIAL)
'The dog probably ran away'

b. Kae-ka amato taranassulkosita.

c. *Kae-amato-ka taranassulkosita.

(38) a. Amato koyangi-wa kae-ka taranassulkosita.
probably the cat and the dog ran away (POTENTIAL)
'The cat and the dog probably ran away.

b. Koyangi-wa kae-ka amato taranassulkosita.

c. *Koyangi-amato-wa kae-ka taranassulkosita.

d. Koyangi-wa amato kae-ka taranassulkosita.

(39) a. Kae-ka amato cis-ko taranassulkosita.
the dog-NOM probably bark-and run away (POTENTIAL)
'The dog probably barked and ran away.'

b. Kae-ka cis-ko amato taranassulkosita.

c. *Kae-ka cis-amato-ko taranassulkosita.

This suggests that these morphemes form words with the preceding stems.

Kuriko, on the other hand, can be either preceded or followed by a parenthetical, as exemplified in (40). Note that for some reason, kuriko cannot be preceded by amato, just as in English and cannot be preceded by probably. But kuriko, unlike -wa and -ko, can be preceded by other parentheticals, as shown in (41) and (42). This strongly suggests that kuriko is an independent word.

(40) a. Koyangi-ka kuriko amato kae-ka taranassulkosita.

b. *Koyangi-ka amato kuriko kae-ka taranassulkosita.

(41) a. Kae-ka amato cicossulkosita kuriko taranassulkosita.

b. Kae-ka cicossulkosita kuriko amato taranassulkosita.

c. *Kae-ka cicossulkosita amato kuriko taranassulkosita.

(42) a. Koyangi-ka, nae saengkak-e, kuriko kae-ka taranassulkosita.

b. *Koyangi-nae saengkak-e-wa kae-ka taranassulkosita.

c. Kae-ka cisossta, nae saengkak-e, kuriko taranassta.

d. *Kae-ka cis-nae saengkak-e-ko taranassta.

Summing up, the evidence points quite clearly to the conclusion that the morphemes -wa/kwa, -ko, etc., are suffixes, whereas kuriko is an independent word.

5. Rule schemata for coordination. Assuming the correctness of our morphological analysis of coordination, [3] the following schemata for coordination can be provisionally postulated:

1. Conjunction word coordination

a. Single conjunction word schema: a single instance of the conjunction word, combined with the final conjunct.

$X \rightarrow H^{+}\ H[CONJ\ b]$
where b is in {kuriko, ttonun, ...}

b. Multiple conjunction word schema: a conjunction word combined with every conjunct

$X \rightarrow H\ H[CONJ\ a]^{+}$
where a is in {kuriko, ttonun, ...}

2. Suffix coordination: a conjunction suffix appears on the head of every conjunct phrase except the last.

$X \rightarrow H[CONJ\ b]^{+}\ H$
where b is in {wa/kwa, hako, ko, ...}

3. Zero coordination: no overt conjunction appears on any conjunct. (This coordinate structure has only the and interpretation).

$X \rightarrow H[CONJ\ nil]^{+}$

In addition, the following rule is required, to license the conjunct word as a left sister of the phrase with which it combines.

4. Conjunction-word rule

$X[CONJ\ a] \rightarrow [CONJ\ a]\ H$

In these schemata, X is a variable over syntactic categories, and the $^{+}$ operator is interpreted in the usual way, as indicating any non-empty sequence of phrases of the specified category. The variable a in 1 ranges over the set of conjunction words, b in 2 over the set of conjunction suffixes. H signifies head, in the sense of X-bar theory, which entails that this node must have the same syntactic category as the node of which it is head.

Rule 1a admits coordinate structures like (43), consisting of any number of daughters lacking CONJ, followed by one daughter which has a value from a for the feature CONJ, (that is, is marked for one of the conjunction words). Each daughter is a head of the phrase.

Rule 1b admits coordinate structures like (44), consisting of a single non-CONJ daughter followed by any number of daughters containing conjunctions. Each daughter is a head of the phrase.

Rule 2 admits coordinate structures like (45), consisting of any number of conjunct daughters and one final daughter which may or may not have the conjunct property. Each daughter is a head of the phrase. The rule schema requires that each conjunct have the same value for the feature CONJ. Since we will assume for other reasons that CONJ is a head feature, then the Head Feature Convention (HFC) could enforce this agreement in conjunction type.

Rule 3 admits cases like (46), consisting of any number of conjuncts with no overt conjunction marker. Note that (46a) can only occur in

syntactic environments where an NP without case is allowed.

Rule 4 admits conjuncts containing a conjunction like kuriko as initial daughter, as in (47).

The examples in (48) are not admitted by any of the coordination schemata.

(43) Koyangi-ka sae-ka kuriko kae-ka
cat-NOM bird-NOM and dog-NOM

(44) Koyangi-ka kuriko sae-ka kuriko kae-ka
cat-NOM and bird-NOM and dog-NOM

(45) Koyangi-wa sae-wa kae-ka
cat-and bird-and dog-NOM

(46) a. Koyangi sae kae
cat bird dog

b. Koyangi sae kae-ka
cat bird dog-NOM

c. Koyangi-ka sae-ka kae-ka
cat-NOM bird-NOM dog-NOM

(47) kuriko kae-ka
and dog-NOM

(48) a. *Koyangi-wa sae(-ka) kae(-ka)
cat-and bird-NOM dog-NOM

b. *koyangi sae-wa kae-ka
cat bird-and dog-NOM

Rules 1 and 2 impose ordering requirements. In suffix conjunction, the conjunct that lacks the conjunction suffix must be last; whereas in kuriko-type conjunction the conjunct that lacks a conjunction must precede all daughters containing the conjunction word. Thus (49), (51) and (52) are grammatical, but (50) and (53) are not.

(49) koyangi-wa sae-wa kae-ka
cat-and bird-and dog-NOM

(50) *koyangi-ka sae-wa kae-wa
cat-NOM bird-and dog-and

(51) koyangi-ka kuriko sae-ka kuriko kae-ka
cat-NOM and bird-NOM and dog-NOM

(52) koyangi-ka sae-ka kuriko kae-ka
cat-NOM bird-NOM and dog-NOM

(53) *koyangi-ka kuriko sae-ka kae-ka
cat-NOM and bird-NOM dog-NOM

Rule 4 introduces a conjunction word as the left daughter of a node with the appropriate value for CONJ. Thus (54) is grammatical, (55) is not.

(54) koyangi-ka kuriko kae-ka
cat-NOM and dog-NOM

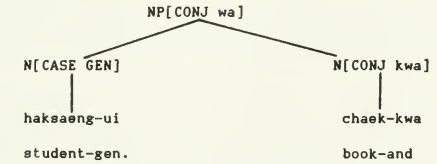
(55) *koyangi-ka kae-ka kuriko
cat-NOM dog-NOM and

Some assumptions behind the analysis need to be discussed. First, we assume that the conjunction suffixes and case markers are attached to noun stems in the morphological component, and that it is there, not in the syntax, that words like koyangi-wa are assigned [CONJ wa]. The obvious alternative is an analysis involving phrasal affixation, which we will examine in Cho and Morgan (forthcoming). We also assume that the morpheme -wa has some feature that permits it to combine morphologically only with noun stems, to form nouns; -ko only with non-noun stems, and so on. Syntactic rule 4 allows a conjunction word like kuriko to combine with a phrase of any category.

Second, we assume the application of feature-propagation principles of the sort proposed in GPSG and other theories. Note that the categories in the ID rules are underspecified both for major category features V and N, and for bar level. We assume that agreement in these features between the nodes labelled X in these schemata will be enforced by feature projection principles like the Head Feature Convention of GPSG, taken together with the assumption that in coordinate structures each conjunct is a head.

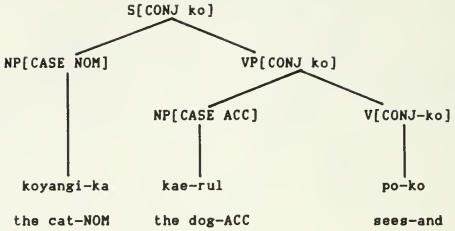
We also assume that CONJ is a head feature, so that NP's whose head N is [CONJ wa] will inherit this marking, as will constituents whose heads have the form Vstem-ko, and so on. This will admit, for example, conjuncts like those in (56) and (57).

(56)



'the student's book-and...'

(57)

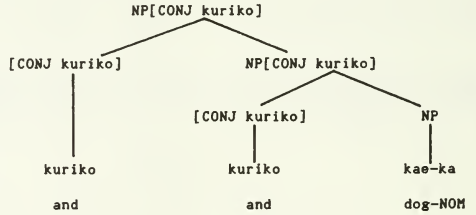


'the cat sees the dog and...'

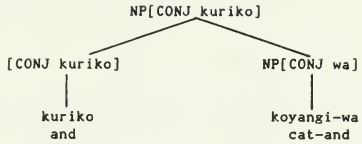
It follows from these assumptions that there are two separate sources for phrases marked for CONJ: in the syntax, rule 4 admits structures with values for CONJ inherited from the conjunction word. In addition, the morphological component builds up words like koyangi-wa marked for CONJ. This property, since it is a head feature, will be passed up to the NP which contains the word as head.

If we interpret rule 4 as allowing free instantiation of the CONJ feature on the head, while enforcing CONJ agreement between the conjunction word and the mother, then the rules will also admit conjuncts of the form (58) and (59), combining kuriko with [kuriko NP] or with NP-wa.

(58)



(59)



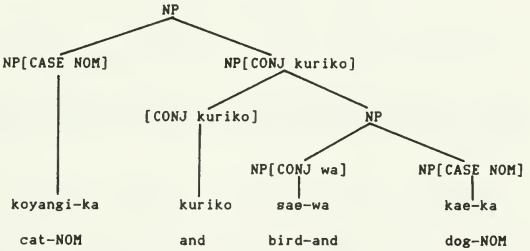
The latter appears to occur, as in cases like (60). The former does not occur; (61) is ungrammatical. This difference may require some adjustment in the rules, but we will not pursue the problem here[4]. The rules also interact to admit sequences like (62), but not with 'flat' structure; rather the structure is as in (63).[5]

(60) koyangi-wa kuriko sae-wa kuriko kae-ka
cat-and and bird-and and dog-NOM

(61) *koyangi-ka [kuriko [kuriko kae-ka]]
cat-NOM and and dog-NOM

(62) koyangi-ka kuriko sae-wa kae-ka
cat-NOM and bird-and dog-NOM

(63)



Conjunct phrases like (64), on the other hand, are most plausibly ruled out in the morphology; presumably word-formation principles that rule out multiple suffixes from the same class would thereby rule out repetitions of the same suffix.

(64) *koyangi-wa-wa
cat and and

As it stands, the analysis so far also makes some incorrect predictions. First, if every conjunct is a head, then the prediction is that every coordinate phrase will be marked [CONJ], and will thus be able to

participate in larger coordinate structures as diagrammed in (65). This prediction is incorrect.

(65) $[_{NP}$ NPwa NPwa NPka] NPka

At present we have no explanation for why structures like (65) cannot occur as instances of the third coordination strategy (schema 3). But we suspect that such conjunction-less coordinate structures are limited to flat structures (hence excluding cases like (65)), either as a matter of grammar or of performance limitations.

Also, note that the rules and the assumed feature principles do not account for the ungrammaticality of examples like those below. We believe there is a simple morphological account of such cases, and will return to them later when we consider the interaction of coordination schemata with morphological principles.

(66) *Koyangi-wa-ka sae-ka
cat and NOM bird-and

(67) *Koyangi-ka-wa sae-ka
cat NOM and bird-and

(68) *Koyangi-ka kae-rul po-ta-ko taranassta.
cat -NOM dog-ACC see-DECL-and ran away
'The cat saw the dog and ran away.'

(69) *Koyangi-ka kae-rul po-ko-ta taranassta.
cat -NOM dog-ACC see-and-DECL ran away

6. The interaction of syntax and morphology. We come now to the crux of the problem: getting principles of syntax and morphology to interact in a way that yields the right predictions about what may be conjoined with what in coordinate NP's.

6.1. Discussion. In NP's coordinated by suffixation (the suffixes (-wa/kwa, -hako, -ina, ...), every conjunct but the last must be marked with a conjunction suffix, and may not be marked for nominative or accusative case, though the conjunction suffix may co-occur with other case suffixes. The final conjunct may be marked for case. The distributional properties of the whole coordinate NP again depend on the case marking properties of the final conjunct. This is illustrated in (70).

(70) a. Koyangi-wa sae-wa kae-ka
cat - and bird-and dog-NOM
'the cat and the bird and the dog'

b. *Koyangi sae-wa kae-ka
cat bird-and dog-NOM

c. *Koyangi-wa sae-wa kae-wa
cat - and bird-and dog-and

d. *Koyangi-wa-ka sae-wa-ka kae-ka
cat-and-NOM bird-and-NOM dog-NOM

e. *Koyangi-ka-wa sae-ka-wa kae-ka
cat-NOM-and bird-NOM-and dog-NOM

An account of the conjunction/case suffix interaction can be constructed using the coordination schemata and the morphological classes set out earlier. Coordination schema 2 assigns flat structure to coordinate NP's like (70). It requires that every conjunct but one carry the feature CONJ, and that each conjunct have the same value for CONJ, hence the same conjunction suffix. The non-CONJ conjunct is required to be last. To this we add the following morphological stipulations:

A. Every overt terminal element in the syntactic tree must be a well-formed word.

B. -wa/kwa, -ina, -hako are members of class 5.

C. No morpheme slot can be filled by more than one morpheme from the same class. (Morphological condition on well-formed words)

It follows from B and C that no noun can simultaneously bear an accusative, nominative or genitive case marker and a conjunction suffix; these case markers compete for the same slot with the conjunction suffixes. The explanation for the ungrammaticality of (70) (d) and (e), then, is just that no two members of morpheme class 5 can occur on the same word.[6]

With kuriko, on the other hand, case is preferred on each conjunct, though it may be omitted, as illustrated in (71). But if it is omitted on one it must be omitted on all, as shown in (72).

(71) a. Koyangi-ka (kuriko) sae-ka kuriko kae-ka
cat - NOM (and) bird-NOM and dog-NOM
'the cat (and) the bird and the dog'

b. Koyangi sae kuriko kae-ka
cat bird and dog-NOM

(72) a. *Koyangi sae-ka kuriko kae-ka
cat bird-NOM and dog-NOM

b. *Koyangi-ka sae kuriko kae-ka
cat - NOM bird and dog-NOM

The final conjunct, on the other hand, is not required by the coordination schemata to have a conjunction suffix. Hence it may freely have or lack a case suffix. But if it has no case marker, then no conjunct

can be case-marked. Presumably X-bar feature inheritance principles (in GPSG, the HFC) would entail that the whole coordinate structure counts as unmarked for case. Sentences containing such a coordinate NP would in general be ruled out by case assignment rules, which will require that the NP have some case according to its syntactic relations in the clause. But as mentioned before, there are in some informal speech styles relaxations of the case requirements which allow NP's to occur unmarked for case. In such contexts coordinate NP's where no conjunct is case-marked could occur.

In general, this analysis makes just the right predictions: since on independent grounds it is clear that case markings that are constructed from the locative are not in class 5, it should follow that they can occur with the conjunction suffix. This prediction is correct, as shown in (73). Then presumably a principle like the HFC will rule out cases like (74). Condition D above will also rule out cases like (75).

(73) Koyangi-e-ke-wa sae-e-ke-wa kae-e-ke
cat-DAT-and bird-DAT-and dog-DAT
'to the cat and the bird and the dog'

(74) *Koyangi-e-ke-wa sae-wa kae-e-ke
cat-DAT-and bird-and dog-DAT

(75) *Koyangi-wa-wa ...

But one serious problem remains: how to prevent the HFC from ruling out (71b). Given the assumption that all conjuncts are heads, we would expect (71b) to be ungrammatical, since (contra HFC) the mother NP has a feature--[CASE NOM]--that is not in the intersection of the daughters. The obvious way of relaxing HFC for such coordinate structures--for example by requiring only that the mother's case marking be the unification of the daughters--would entail (incorrectly) that (74) is grammatical. What our analysis lacks is a principle that entails that all non-final conjuncts must have the same case marking, while allowing the final conjunct to differ from all others in that it may be an extension of them.

Notice further that in every coordinate structure, it is the final conjunct that behaves as head in determining the case of the mother. In this respect coordinate structures share the head-final character that pervades Korean syntax. Yet the otherwise useful assumption from Sag et al. (1985) that all coordinate daughters are heads prevents capturing this generalization. Here we have a case where the final conjunct is, as it were, first among equals.

6.2. Summary. It is appropriate at this point to summarize our observations.

6.2.1. Conjunct marking. In NP's coordinated with kuriko, two patterns are possible: kuriko may be combined with the final conjunct only, or it may be present in every conjunct but the first. In case of conjunct marking by suffixation, every conjunct but the last must bear a conjunction suffix. In zero coordination, no conjunct bears either a word or suffix as conjunction

marker.

6.2.2. Case marking. The following generalizations hold for all three types of coordination:

a. For non-final conjuncts, either all are case-marked or none are case-marked (though case on all seems to be preferred in kuriko coordination), and of course there must be no conflict in overt case-marking.

b. The final conjunct is a special case in two respects: first, case marking on non-final conjuncts must be a subset, so to speak, of case marking on the final conjunct, in the following sense: the final conjunct must not bear an overt case marker for a case distinct from the case overtly marked on non-final conjuncts. But it may have case marking when non-final conjuncts have none. But if the final conjunct has no case marker, then non-final conjuncts must not have case markers.

c. It is the case marking on the final conjunct that determines the case marking status of the coordinate NP as a whole. If the final conjunct is case-marked, then the whole NP may occur in any position consistent with that case. If the final conjunct bears no case marking, then the whole NP can occur only in positions where case marking is not required.

6.3. Implications. If a GPSG-style analysis of coordination is to be maintained for Korean, together with an analysis of conjunction marking that takes conjunction suffixes to be non-phrasal, some changes are necessary. In particular, we need to distinguish the final conjunct as head for the purposes of assigning case properties to the mother, and for the purpose of allowing the final conjunct to be marked for case even though the non-final conjuncts have no overt case marking. At the same time we need to insure that case marking on non-final conjuncts agrees with that on the final conjunct where more than one conjunct is case marked, and to insure that non-final conjuncts are identical in their case marking. At present the only obvious candidate solution is to posit some obvious and direct auxiliary principle to cover just cases of coordination (or perhaps multi-headed structures in general), incorporating generalization c above directly into the grammar of Korean.

Summarized, the right principles might look like this:

a. In coordinate structure, one conjunct is head.

b. All non-head conjuncts must agree in head features.

c. The head conjunct must be an extension of every non-head conjunct (that is, the features on each non-head must be a subset of those on the head conjunct).

d. The head conjunct must be final.

e. Head properties of the mother are those of the head conjunct.

The most satisfactory solution would be one that derived the special properties of the final conjunct from whatever X-bar principle it is that determines the uniformly head-final nature of Korean syntax. At present we see no way to reconcile this goal with the goal of preserving the analysis of coordination that derives its explanatory power from treating all conjuncts as heads. It remains to be seen whether an analysis that treats conjunction and/or case suffixes as phrasal affixes can provide a solution to this dilemma. We will examine this question in future work.

NOTES

[1] Some forms that might appear superficially to be case markers (or postpositions), like mith in (i) for example, are probably best analyzed as nouns that form compound nouns with the preceding noun stem, hence can themselves take case markers.

i. Chaeksang-mith-e
desk under-LOC
'under the desk'

[2] The ungrammaticality of (13c) is most likely due to a morphological principle that rules out words consisting only of verb stems. Notice that noun stems may stand alone as words, as in (13a). But verb stems must combine with some suffix to form a word. As far as we can see at present, this fact does not follow from more general principles, but must somehow be stipulated fairly directly in the word formation rules. See Cho and Morgan (1987) for more discussion.

[3] For simplicity of exposition we incorporate both categorial and ordering information in these rules, rather than following the standard ID/LP separation of GPSG.

[4] It is quite possible that cases like (61) could be admitted in the syntax but ruled out on semantic or pragmatic grounds, since the doubling of the conjunction kuriko is either semantically anomalous or pragmatically pointless.

[5] Note that (68) is well-formed if the verb suffix -ko is taken to be a complementizer rather than a conjunction. This fact does not affect our analysis, which predicts only that (68) cannot be a conjunct in a coordinate structure.

[6] A problem for our analysis is that -wa/kwa and -un/nun may co-occur, as in the following:

i. Koyangi-wa-nun kae-ka han thim-i tweossta
cat-and-TOP (focus) dog-and one team-NOM became
'The cat and the dog became a team.'

This co-occurrence seems to be restricted to uses of -wa/kwa that have the flavor of English 'together with', rather than simple coordination. Similar examples with -ina, 'or', in place of -kwa are ungrammatical. We strongly suspect that these cases are not real instances of coordination, hence not genuine counter-examples, but are instances of a double usage of the same morpheme with a syntax reminiscent of English 'together with'. We suspect that the apparent anomalies can be explained by an analysis in which this morpheme is simultaneously in two morpheme classes; taken as a member of class 5 it has the semantics of conjunction and behaves in a way that is consistent with our analysis. Taken as a member of class 3, it has the semantics of 'with' and the syntax of a postposition or a case marker, thus presenting no real counter-examples to our analysis. This anomaly occurs only for this one morpheme, not, for example, for -ina, which is perfectly consistent with our analysis.

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A STUDY OF COHERENCE IN KOREAN SPEAKERS' ARGUMENTATIVE WRITING IN ENGLISH

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This paper examines two aspects of coherence--text structure and coherence breaks--in Korean speakers' argumentative writing in English, compared with the writing of native speakers of English as well as of their first language group. The structure of the eleven essays on the three argumentative tasks given to them is analyzed using the interactional approach elaborated by Aston (1977) and Tirkkonen-Condit (1985). Coherence breaks found in the essays are described following Wikborg's (1985:95) classification supplemented by four additional types. The results of the analysis of text structure show that the dominant structure of the English essays of native speakers is claim+justification+conclusion, while no one pattern represents the writing of native speakers of Korean in their first language; the same is true of the five English essays of Korean speakers. Furthermore, the Korean essays are structurally non-linear as compared to English essays of native speakers. Two out of the five English essays of Korean speakers exhibit the circular structure. There are, however, similarities in the English and Korean essays; e.g. in the three basic components of text structure--claim, justification and conclusion. These common features suggest there may be a set of universal features characterizing argumentative texts. The findings in the analysis of coherence breaks show that there are many more coherence breaks in the writing of Korean speakers than in the writing of English speakers, which seems to suggest that coherence breaks might be much more tolerable in Korean than in English. Many of the most frequent types of coherence breaks overlap in the English and Korean essays of Korean speakers (e.g. misleading and missing sentence connection).

0. Introduction

Since attention in linguistic analysis was directed to "discourse" or "text,"[1] teachers and researchers of writing have begun looking at linguistic levels beyond the sentence level, i.e. a whole text. Their main focus has been textual features such as text structure, cohesion, etc. Text analysts are not only concerned with providing descriptions of

different types of text but also with proposing a method of description (Longacre 1983, Beaugrande, 1980; Grimes, 1975; van Dijk, 1977 and 1980; Aston, 1977; Hoey, 1979 and 1983; Tirkkonen-Condit, 1985). In addition, some of the text analysts have conducted contrastive studies in an attempt to characterize different types of texts in a language and a single type of text in various languages, and of helping non-native writers to improve their writing skills in the target language (Kaplan, 1966; Hindi, 1983; Kachru, 1982; Katchen, 1982; Kobayashi, 1984; Pandharipande, 1982; Connor, 1984).

Most of the studies on written text have investigated narrative and expository text. Until recently, argumentative texts have not attracted much attention. There are, however, a few studies of such texts (Aston, 1977; Tirkkonen-Condit, 1984 and 1985; Connor, 1984; Connor and Lauer, 1985). Argumentative writing is very important in American schools because argumentative tasks are very frequently given to students in class examinations.[2] With the ultimate purpose of helping Korean speakers to write argumentative text in English, this paper investigates the argumentative writing of Korean speakers in English compared with that of native speakers of English and that of their first language group. The paper focuses on two aspects of coherence: text structure and coherence breaks. Text structure is analyzed using the interactional analysis proposed by Aston (1977) and Tirkkonen-Condit (1985) in which the text is viewed as an interaction between the reader and the writer and the main concern is the communicative purpose of sentences and their interactional relationships. The analysis of coherence breaks (features which make it difficult for the reader to understand the text) is based on the taxonomy of types of breaks proposed by Wikborg (1985) which include six topic-structuring problems and five cohesion problems.

The questions the study addresses are as follows:

1. Is there a text structure representing the argumentative writing of native speakers of English and Korean, respectively?

2. Is the argumentative writing of Korean speakers in English similar to that of native speakers of English or to that of their first language group in terms of text structure?

3. What kind of coherence breaks frequently occurs in each of the three groups of writing? Are there similarities or differences in the type of the most frequent breaks among the three groups of writing?

The first two questions are the ultimate goal of this research. They are investigated less directly than the third question.

The paper is divided into four parts. In the first part, theoretical background of the present analysis and methods of data collection are discussed. In the second part, the results of the study are discussed. The first subpart discusses the first and second questions above and the second subpart the third question. The third part discusses the limitations of the study. Finally, a summary of the discussion is presented, followed by a conclusion, and implications of the study for discourse analysis are pointed out.

1. Theoretical Background and Methodology

1.1 Text Structure

Coherence refers to the semantic relations of text beyond the surface form. It is a function both of the text (e.g., cohesive ties[3]) and of the hearer/reader's ability to interpret--his ability "to reconstruct the speaker's or the writer's plan with reasonable certainty by inferring the relations among the sentences, and their individual relations to the various subgoals in the inferred plan for the enterprise understood to be at hand" (Green, 1986:71).

In order to describe text structure, various models have been proposed (Beaugrande, 1980; Brown and Yule, 1983; van Dijk, 1977; Grimes, 1975; Hoey, 1979 and 1983; Kaplan, 1972; Aston, 1977, etc.). Among the models proposed, the interactive text analysis based on speech act theory has been used in the studies on the structure of argumentative texts (Tirkkonen-Condit, 1984 and 1985; Connor, 1984). In this model, the text is seen as an interaction between the reader and the writer. The communicative act of each T-unit[4] or sentence is defined in terms of illocutionary acts with Searle's (1976) classification: representatives, directives, commissives, expressives and declaratives. The illocutionary act "representative" (illocutionary acts representing a state of affairs) has been noted as the communicative act which occurs most frequently in argumentative texts (Aston, 1977; Tirkkonen-Condit, 1985). The subcategories of this act have been presented by Aston (1977:477-481): statement, assertion and reported assertions.[5] Besides the identification of illocutionary acts, relationships between T-units or sentences are determined in terms of interactional roles (e.g. situation, problem, solution, evaluation, justification, explanation, conclusion, enlargement, exemplification, metastatement, etc.). The illocutionary and interactional description provides the hierarchical and logical structure of relevant assertions, which is a very crucial feature contributing to coherence in argumentative texts.

For describing text structure in English and Korean argumentative texts the present study adopted the interactive text analysis, following Tirkkonen-Condit's (1984 and 1985) and Connor's (1984) research. The study used the definition of the interactive roles and the classification of their hierarchical position presented in Tirkkonen-Condit's (1985) research, as follows[6]:

> Situation states facts and circumstances which serve as background information to the problem. It is typically followed by problem. Their hierarchical relation is coordinate to each other. The typical type of sentence of situation is statement.
>
> Problem is an assertion which the writer does not believe/expect the reader to share in the truth of the propositions expressed. It often includes a negative evaluation of the facts and circumstances introduced in the situation component. Its hierarchical position is coordinate to the adjoining acts such as situation or solution. This role is often marked by adversative conjunction (e.g. but, however, etc.).

Solution is an act which puts forward recommendations and proposal as to how the problem should be solved. It is coordinate to the adjoining act which is typically problem or evaluation. Some of the linguistic features marking this function are causal conjunctives, such as therefore, and so and directive type of sentences (e.g. ...must be done...).

Evaluation consists of a positive evaluation or a negative evaluation. Negative evaluation usually initiates the problem component, while positive evaluation follows the solution and speculates on the feasibility or the outcome of the recommended solution. Evaluation is coordinate in relation to the adjoining act which is solution. This function is frequently marked by quality-attributing adjectives (e.g. good, bad, important, untenable, etc.).

Justification accounts for communicative acts in the sense that it gives reasons for acts or actions. It is typically subordinate to the preceding act.

Explanation accounts for causes for propositions or facts. This act usually interacts with statements, while justification is likely to interact with assertions. Explanation is subordinate to the preceding act.

Elaboration is an act which specifies, or gives details, particulars, or other elaborations of the preceding act. It is subordinate to the preceding act. One of the conjunctives used is in particular.

Exemplification is one type of elaboration, but, it is classified as an independent category. This act exemplifies an aspect of the state of affairs or proposition expressed in the preceding act to which it is subordinate.

Enlargement is generalization in relation to the preceding act. It is superordinate in relation to the preceding act. An example of conjunctives marking this role is all in all.

Conclusion presents an assertion or a statement which is justified or explained by the preceding act to which it is superordinate. It also states the consequence of the cause specified in the preceding act. Conjunctives marking the function are in conclusion, to sum up, therefore, as a result, etc.

Metastatement is an act whose role is to make explicit the relationship of the subsequent act to the preceding act. This act is subordinate to the preceding act. It is characterized by certain types of sentences, such as I will discuss..., and ...has expressed the following idea.

Reformulation constitutes a paraphrase or a restatement of the preceding act. It repeats the illocutionary features of the preceding act to which it is subordinate. For example, the reformulation of an assertion is itself an assertion. One of the conjunctives used for this function is in other words.

Addition is a paratactic predicate related to the preceding act. This act usually appears in a position in which it shares the interactional role of the preceding act. The act is often marked by additive conjunctives (e.g. in addition, moreover, also, etc.)

For the present study, 11 argumentative essays were collected from Korean and American graduate students at the University of Illinois (see Section 1.3). In the analysis of text structure, each essay was first broken into T-units or smaller units when the identification of clear interactive relationship was necessary. After determining the relationships between T-units, the structure of the text was presented in a diagram, as in Appendix 2. When the identification of interactive roles was not clear, no label was presented. The relative hierarchy between T-units determined by their interactive relationships was marked by arrows: if the interactive role of a T-unit was superordinate to that of the other, the arrow is headed from the latter to the former and if the hierarchical position between the T-units is coordinate, they are connected not by an arrow but by a line.

1.2 Coherence Break

Text analysts have investigated what makes a text coherent and what is a reliable and valid indicator of coherence; however, what breaks coherence has not been specifically examined except in Wikborg's (1985) research. Wikborg's study was mainly concerned with types of coherence breaks in university student essays written in English and Swedish. In order to find the types of breaks, she marked breaks and the disturbing features which made the line of reasoning more difficult to follow and then attempted to describe the breaks and disturbing features. The types of coherence breaks found were six topic-structuring problems and five cohesion problems as below (Wikborg, 1985:95):

(1) Types of coherence breaks in student writing

I. Topic-structuring problems
   1. Unspecified topic
   2. Unjustified change of/drift in topic
   3. Misleading paragraph division
   4. Irrelevance
   5. Misleading disposition
   6. Misleading headings

II. Cohesion problems
   7.1 Missing, or insufficient number of, references to the cohesive chains which have been established as central to the topic;
   2 Insufficient number of cohesive chains
   8. The distance between the cohesive items in a chain is too great.
   9. The inference ties are uncertain because:
   1 reference items lack an unmistakable referent in the text;
   2 there is insufficient specification, with the result that a)

the tie between two cohesive items is difficult to follow or b) there are two many possible interpretations of what such a tie might be.

10. The type of cohesive tie attempted does not actually hold.
11. Misleading information structure, because of
    1 the distribution of given and new information within the sentence;
    2 missing or misleading sentence connection.

The types of coherence breaks which were the most frequent were Type 9, 3, 11.2, 2 and 1 in the above list. Wikborg has provided the definitions of only these five types with examples. One of the weak points of Wikborg's study is that she did not consider the possibility that coherence breaks identified by native speakers of English could be different from those identified by native speakers of Swedish and consequently, she interpreted the types of coherence break found as applicable to both English and Swedish texts. In the present study, Wikborg's notion of coherence break is used for both Korean and English essays. It will be investigated in the future research whether the notion of coherence break is language-specific.

In the present study coherence breaks were first marked and their types were identified. The study used nine categories of Wikborg's taxonomy because it was not clear what type of coherence breaks misleading disposition and misleading headings were. Besides the nine categories, four other types found in the study were added to the classification of the types of coherence breaks: misleading lexical items, lack of adequate justifying supports, lack of some information or explanation, insufficient linking of the inductive statements to the preceding discussion. They will be discussed with examples in 2.2. While determining the type of coherence breaks, when an overlap between the types of a coherence break was found, the break was marked under both categories instead of one of the categories.

1.3 Data Collection

The data for this study were eleven essays written by three American students and six Korean students at the University of Illinois.

Since the main purpose of the study is to help Korean speakers to write argumentative text in English on the tasks they may really have to carry out in American schools, some restrictions were inevitable in the selection of the topics and consequently the subjects. The three topics given in the questionnaire, as stated below, were taken from the test questions the researcher had taken in her TESL and linguistics classes in the United States. In order to make the writing easier, supporting evidence for each topic was provided (see the questionnaire in Appendix 1).

1. argument or counter-argument for the Sapir-Whorf hypothesis

2. argument or counter-argument for Dulay and Burt's claim that L1 and L2 acquisition processes are more or less the same.

3. nativist's argument against behavioristic approach to language acquisition.

The questionnaire was distributed to those who might have taken the courses related to topics such as psycholinguistics. Half of the Korean speakers were randomly selected to write in English.

Only nine out of thirty students voluntarily participated in the study. As a result, the size of the data was much smaller than expected in the research design. One Korean student wrote an essay for each topic. Her three essays were shorter than the other essays; however, all of her essays were analyzed.

The following list illustrates the eleven essays analysed, in terms of the language written, the native language of the writer and the topic chosen.

Essay A: English essay written by English speaker 1 on Topic 1
Essay B: English essay written by English speaker 2 on Topic 1
Essay C: English essay written by English speaker 3 on Topic 3
Essay D: Korean essay written by Korean speaker 1 on Topic 1
Essay E: Korean essay written by Korean speaker 2 on Topic 1
Essay F: Korean essay written by Korean speaker 3 on Topic 3
Essay G: English essay written by Korean speaker 4 on Topic 1
Essay H: English essay written by Korean speaker 5 on Topic 1
Essay I: English essay written by Korean speaker 5 on Topic 2
Essay J: English essay written by Korean speaker 5 on Topic 3
Essay K: English essay written by Korean speaker 6 on Topic 2

Since the size of the data is small and the topic of the writing task is register-specific, any results derived from the study would be necessarily tentative.

2. Results and Discussion

2.1 Text Structure

The text structure of the eleven essays was analyzed following the interactive text analysis model. The results of the analysis show that there are differences between the writing of native speakers in English and Korean and these differences are also found in the writing of Korean students in English. In other words, in one aspect, some of the English essays of Korean students share the features found in the native English model, while the others are more similar to the writing of the first language group.

The first difference found between the writing of the two native groups is that there is a preferred structure in the English essays, while in the Korean essays there is not. The structure found in all essays of the native speakers of English regardless of differences in topics is claim + justification + conclusion (see Table 1). In this structure, the first unit presents the assertion of the writer, which is the thesis statement of

Table 1

The outline of text structure

Subject	Language	Topic	Structure
English speaker 1	English	1	claim + justification + conclusion
English speaker 2	English	1	claim + justification + conclusion
English speaker 3	English	3	claim + justification + conclusion
Korean speaker 1	Korean	1	claim + justification + conclusion + claim + justification + conclusion
Korean speaker 2	Korean	1	claim + justification + conclusion
Korean speaker 3	Korean	3	claim + justification + claim +justification
Korean speaker 4	English	1	introduction + elaboration + conclusion
Korean speaker 5	English	1	claim + justification + conclusion
Korean speaker 5	English	2	claim + justification
Korean speaker 5	English	3	claim + claim + conclusion
Korean speaker 6	English	2	claim + justification + conclusion

the essay, sometimes with background information; this claim is supported by arguments in the following unit; and then, the concluding unit reasserts the assertion or reaches a conclusion from the previous discussion.

In the writing of Korean speakers in Korean, on the other hand, each Korean essay has a different organizational pattern. One essay is organized the same as the preferred structure in the writing of native speakers of English, while the other two essays have structures with other combinations of the three components: claim, justification and conclusion. For instance, the essay of Korean speaker 3 is organized as claim + justification + claim + justification. In the essay, the writer first provides her negative evaluation on the behavioristic approach to first language acquisition in the first unit and justifies the claim in the next unit; then, she presents another claim--a positive evaluation of the nativistic approach to first language acquisition--and its supporting reason (see the description of the essay in Appendix 2). This claim + justification + claim + justification structure could be accounted for by the nature of the argumentative task. The assigned question, as in (2), requires the writer to write an answer against the behavioristic model, supporting the nativistic model.

(2) The behavioristic model of first language acquisition claims that "the child comes into the world with a tabula rasa, a clean slate bearing no preconceived notions about environment, slowly conditioned through schedules of reinforcement." Assume you agree with the nativistic approach and write an argument against the behavioristic approach.

Instead of making one claim against the former as a nativist, Korean speaker 3 develops two separate arguments for each point. The double nature of the task itself cannot, however, justify the structure repeating the combination of claim and justification, because for the same task English student 3 has not written two separate arguments but she has made one claim combining both points: "Cognitive code language learning theory is a theory that explains some of the phenomena in language learning which bahaviorism cannot account for" (the writer used the term "cognitive code language learning" instead of nativistic approach, assuming they share the same approach to first language acquisition).

Among the five English essays by Korean students, two essays share the structure preferred in the native English model, while three essays are organized in different patterns similar to the Korean essays (see Table 1). In the latter, one essay lacks a concluding unit; another has two claim units without the justification parts; and the third is very distinct not only from the native English model but also from the first language group, because it does not contain a claim nor a justification unit that the English and Korean essays contain without exception. This distinctive essay is the writing of Korean student 4 on Topic 1. In the essay, the writer does not provide her evaluation of the Sapir-Whorf hypothesis in the introduction part; rather, she presents a metastatement as the thesis statement, as in (3)

(3) An extract from the English essay of Korean speaker 4 on Topic 1

.... 3) There are many pros and cons about this hypothesis. 4) In this paper, I am going to discuss the pros and cons about the hypothesis to see whether it is right.

Since in the initial unit the writer just specifies what she will discuss in the body part, the first part cannot be labelled as a claim unit nor the body part as a justification unit.

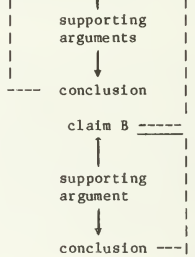
There is one more point to be discussed about the structure of the English essays of Korean speakers. Variations in the text structure of the essays do not exist only with respect to individual writers but also with respect to the topics. The three essays of Korean speaker 5 on three different topics are structured with different organization patterns each. Since the topics of the essays are different, one can say that the variations in the text structure may be due to those in topics. This claim is, however, premature because the essays on the same topic (Essay G and H, and Essay I and K) illustrate different organization patterns depending on writers and furthermore, two essays on different topics (Essay H and K) share one structure. Thus, it seems that further research with more data is needed to see whether topic would be a factor affecting the structure of the writing of Korean speakers in English.

One other difference found between the Korean and English essays of native speakers is worth mentioning. The argumentative writing of American students is structurally linear. In other words, the thesis statement (usually the writer's main claim) is presented in the first unit, and the following units develop or support it without bringing a new important topic or claim; then, the concluding unit refers back to the thesis and/or subtopics in the justification unit. In contrast, the structure of the Korean essays analyzed in this study is not always straightly linear. In the Korean essays, another claim is presented besides the one in the initial part, as shown in the claim + justification + claim + justification structure in the essay of Korean speaker 3 mentioned above.

The writing of Korean speaker 2, which has the same structure as that of native speakers of English, also illustrates the unexpected introduction of a new claim. In the writing, the writer first presents his claim and its two supporting arguments. After each supporting argument, a conclusion is drawn. When the writer provides a conclusion after the second supporting argument, he suddenly presents a negative evaluation on the conclusion, followed by a piece of justifying evidence. In the concluding unit of the essay he then reasserts the first claim in the initial part and the negative evaluation on the inductive statement.

The essay of Korean speaker 1 demonstrates an interesting indirect development of arguments, as shown in (4). In the initial unit of the essay, the writer presents a claim which is a choice statement(A or B): "It is argued by providing counter-evidence that the Sapir-Whorf hypothesis must be weakened or cannot be retained." The next paragraph provides two supporting arguments for both A and B; and the following paragraph reaches a conclusion which reasserts only A. Then, the writer suddenly refers back to B, providing evidence supporting it in the next paragraph and in the final paragraph he concludes the essay asserting B.

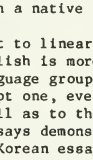
(4)



Before reaching the paragraph bringing back B in the choice statement, the cooridnator "or" in the thesis seems inclusive, since A and B both imply a negative evaluation of the Sapir-Whorf hypothesis. But, when one reads the fifth paragraph, one realizes the coordinator "or" was exclusive. This kind of topic shift seems to illustrate a step-by-step strategy the writer uses: first convince the reader of the weaker claim and then present the stronger one. A similar strategy has been identified in an Indian's interaction with a native speaker of British English in Gumperz (1982).

With respect to linearity in text structure, the writing of Korean students in English is more similar to the native English model than to their first language group. The writer's point is relatively consistent in the essays except one, even though the linking of supporting arguments to the claim as well as to the conclusion is questionable in some essays. However, two essays demonstrate the step-by-step or circular strategy found in some of the Korean essays. One of these essays is the essay of Korean speaker 4 discussed before. In her essay, the Korean speaker first illustrates arguments and counterarguments for the Sapir-Whorf hypothesis and then, she presents her position as the conclusion of the essay (see the description of the structure in Appendix 2). The bottom-up approach is also found in the structure of paragraphs in the essay, as the outline of the third paragraph demonstrates:

(5) Paragraph 3 in the essay of Korean speaker 4



The other essay demonstrating a circular structure is the writing of Korean speaker 5 on Topic 3 (see the description of the structure in Appendix 1). In the writing, the first two paragraphs present a positive and a negative evaluation of the behavioristic model, respectively and then the final paragraph presents the writer's main point: "the evaluation of behaviorism depends upon how language acquisition is defined." Thus, the writer's point is not revealed until in the final paragraph.

While there are variations in the three groups of writing, some features of text structure are shared among them. First, the first unit is typically a claim unit which presents the writer's point. Next, the claim unit usually contains situation and evaluation, as in Table 2. The former functions as providing a topic and background information and the latter as presenting the writer's point about the situation. In the essays analyzed, most of the evaluation is negative, because of the topics given. Finally, the structures of the essays analyzed have, except Essay G, a combination of three components: claim, justification and conclusion. This finding suggests that the three components are the basic components in both English and Korean argumentative texts or perhaps in argumentative texts in general.

Table 2

Type of sequences in the claim unit*

Subject	Language	Topic	Sequence type
English speaker 1	English	1	situation + neg. evaluation + metastatement
English speaker 2	English	1	neg. evaluation + elaboration
English speaker 3	English	3	situation + neg. evaluation + pos. evaluation
Korean speaker 1	Korean	1	situation + implicit neg. evaluation + metastatement + solution neg.evaluation + solution
Korean speaker 2	Korean	1	neg.evaluation + elaboration
Korean speaker 3	Korean	3	negative evaluation situation + pos.evaluation
Korean speaker 4	English	1	situation + metastatement
Korean speaker 5	English	1	neg.evaluation + metastatement
Korean speaker 5	English	2	situation + evaluation
Korean speaker 5	English	3	neg.evaluation + metastatement + pos.evaluation + reformulation neg.evaluation
Korean speaker 6	English	2	neg.evaluation + pos.evaluation + neg.evaluation

*If there are more than one claiming unit, the sequences in each unit are listed separately; the initial unit of the essay of Korean speaker 4 is included in the above list even though the essay does not have a claim unit at all.

2.2 Coherence Break

While analyzing coherence breaks, four types of breaks were found besides those in Wikborg's (1985) classification. One of the four types is misleading lexical items referring to the instance in which the use of a lexical item in a wrong context or the ambiguous meaning of a lexical item in the text makes it difficult for the reader to understand the text. This type of coherence breaks is illustrated in the example (6). The underlined words in the essay are not easily comprehensible. The meanings of the words repetition, follow, experience, regularity and irregularity in the example are not clear. The phrase appropriate expression and the word punctual seem to be inappropriate to the register. These misleading

lexical items are one of the disturbing features which make the line of reasoning difficult to follow.

(6) The English essay of Korean speaker 5 on Topic 2

1) There can be both similarities and differences b/w L1 and L2. 2) But I think learning mechanism is almost same--learning by repetition.

3) Although language has grammar, it does not always follow grammar. 4) Also to be fluent in a language does not mean to be punctual in grammar. 5) Fluency depends on its appropriate expression, too, 6) and this can be acquired thru repetition (i.e. experience).

7) Children also learn regularity of language first as do adults. 8) This regularity (i.e. grammar) can serve as a base for speaking or writing a language. 9) So if they know about regularity, they are likely to overgeneralize it. 10) Irregularities are learned thru experience both in children and adults who learn L2, 11) and this will lead to fluency.

The second type of coherence breaks identified is a lack of adequate justifying supports, which has been pointed out in Connor's (1984) study on ESL students' argumentative writing. It is also demonstrated in the above example. In argumentative writing, it is very crucial to provide sufficient supporting arguments for the claim made, because without them the text would not be convincing. The second and third paragraphs in (6) contain many assertive statements lacking justification (e.g. 6, 9, etc.). The writer of the essay seems to assume that the assertions are shared with the reader. However, they are not really shared knowledge. For example, the writer asserts that children have a tendency to make an overgeneralization of regular forms of language. This assertion requires some justification, such as children's utterances illustrating overgeneralized forms. In addition, the same type of coherence break is found between the writer's claim in the T-Unit 2 and its justifying argument in the second and third paragraphs: the line of reasoning in the supporting argument is very difficult to follow and furthermore it is not direct enough to justify the claim. Therefore, a lack of adequate justifying supports is not only applicable to individual assertive statements without any justification but also to the logical relation between an assertion and its supporting arguments. This type of coherence break would be found more often in argumentative text than in any other type of text because of its nature.

The next type is "insufficient linking of the inductive statement to the preceding discussion." This type has also been identified in Connor's study (1984), even though she does not use the term "coherence break". It includes misleading logical reasoning. An example is the second paragraph of the essay of Korean speaker 4 on Topic 1, as in the example (7). In the paragraph, the conclusion given in the T-unit (16) does not follow from the previous arguments. The writer attempts to present two supporting pieces of evidence for the Sapir-Whorf hypothesis in order to reach the

conclusion: "language affects society." On the contrary, the arguments lead to the conclusion that language does not influence thought. The contradiction in the reasoning causes a break in coherence.

(7) The third paragraph of the English essay of Korean speaker 4 on Topic 1

5) Some African languages have only three terms for "color"; 6) therefore he can tell only three colors. 7) The question is "If he can tell only three colors, then does he see only three colors in a rainbow?" 8) The answer is "not." 9) His language which has only three terms for color affects his conceptualization and categorization. 10) His linguistic knowledge limits his concept of "color," 11) and thus he can tell only three colors, even though he perceives there are other colors than the three. 12) Hopi has no tenses in making a verb phrase. 13) Therefore the concept of time is different from Hopi and English speaks [sic]. 14) However, Hopi recognizes the differences between present, past and future tense. 15) They just don't have the vocabulary or linguistic items to express the concept of time. 16) From the examples of "color" and "time," language seems to affect the society where the language is used. 17) However, we can see the further examples that show the different point of view.

The fourth type of coherence break found is sentences lacking some crucial information or explanation in order to be understood. In the following literal translation of Essay E, for instance, the T-unit (9) is not comprehensible because it is missing the information that English has only one word for snow. The second clause in (10) is not also understandable unless the reader is aware of the fact that there is only one Korean native word for blue and green. Since the writing task given in the study was a form of class examination and the reader was supposedly the instructor who had made the questions, the missing information in the two examples can be justified by claiming that the reader already has that information. However, it is questionable whether the reader would not be disturbed by the missing information, even though he shares it with the writer.

(8) An extract from the Korean essay of Korean speaker 2 on Topic 1

---> 9) Eskimo [sic] sahoy-ese-n+n nun-i cungyoha-nikka nun-e tayhan ehwi-ka paltal-toy-e iss-ciman k+roh-ta-ko mikukin-i ssaraknun, hampaknun t+ng-+l kupyol mos-ha-n+n kos-i ani-ta. 10) Color
---> Terminology [sic]-to i-wa-kath-i chai-r+l poi-n+nte munhwacek-i-n chai-rako emkkyok-hi mal-ha-l su-n+n eps-ciman yoki-se-cocha hankukin-+n chung-kwa nok-e tayhay saykmayng-i-ra-n+n mal-+n an toy-n-ta.

(Translation)

---> 9) Since snow is very important in Eskimo's society, words for snow are developed, but even so, it is not that American people cannot distinguish small pellets of snow, big-flaked snow, etc. 10) Color terminology demonstrates a difference in the same way.

--→ Although one cannot say the difference is a cultural difference, it does not also make a sense to claim that Koreans who cannot distinguish blue and green are color-blind.
(Numbers refer to numbers of T-units in the original essay in Korean.)

Frequency of coherence breaks of Wikborg's nine categories plus the above four was counted, as in Table 3. It was found that the total number of coherence breaks is very different between English speakers' and Korean speakers' writing. While only one instance of coherence break is marked in the essays of English speakers, there are 23 instances in the essays of Korean speakers in Korean and 37 instances in the essays of Korean speakers in English.

One finding in Korean speakers' writing is that there are as many coherence breaks in Korean speakers' writing in their native language as in English. This seems to suggest that Korean speakers do not pay much attention to organizing their writing coherently for the reader's point of view or that coherence breaks are much more tolerable in Korean writing. Before drawing this kind of conclusion, however, further research is needed.

Another finding is that the most frequent types of coherence break overlap in their Korean and English essays, as in Table 3. In the former,

Table 3

Frequency of the types of coherence break*

Type of coherence break	Subject/Language		
	English/ /English	Korean/ /Korean	English/ /English
1 unspecified topic	1		1
2 unjustified topic drift		3	2
3.1 change of topic within orthographic paragraph			2
2 change of orthographic paragraph without changing subjects		3	1
4 distance between cohesive items			1
5. Inference ties are uncertain			
1 unmistakable referent in text		3	5
2 insufficient specification		2	1
6.1 missing sentence connection		3	3
2 misleading sentence connection		2	9
7 misleading lexical items		3	10
8 lacking information/explanation		2	2
9 lacking adequate justification		4	6
10 insufficient linking of inductive statements to the preceding discussion		1	3

*Categories which have no instance are not listed in the table.

the most frequent types are "uncertain inference ties," "missing and misleading sentence connection," and "lacking adequate justifying supports." The same types of coherence breaks are also the most frequent in the latter. The category of coherence breaks which is frequently marked only in the writing of Korean speakers in English is misleading lexical items. The frequent occurrence of this type of coherence breaks may be accounted for by their lack of fluency in English which is not as good as in their native language. This explanation is supported by the finding that more instances of misleading lexical items are found in the essay of the Korean speaker whose English is less fluent, as demonstrated in (6).

While the most frequent types of coherence break are similar between the writing of Korean speakers in their native language and English, some variations are found in their subtypes. First, Korean speakers tend to start a new orthographic paragraph without changing topics in their writing in Korean, while in English they change topics within an orthographic paragraph. In two Korean essays many paragraphs were only one sentence long. One of the writers (Korean speaker 3) continuously changed paragraphs without considering topic continuity, as the description of the structure of her essay shows in Appendix 2. In one English essay of a Korean speaker, in contrast, a transitional sentence appears at the end of a paragraph instead of at the beginning of the next paragraph, as illustrated in example (7). In another English essay, the claim and justification units are written in one long paragraph. The variation found in paragraphing might be explained by the following fact: formal paragraphing is much more flexible in Korean as compared with English and thus, Korean speakers are not concerned much about paragraphing in their writing in Korean and change orthographic paragraphs frequently without changing subjects; on the other hand, Korean speakers, especially those who are studying in American schools, know the importance of paragraphing in English, but they have not been instructed adequately about how to do paragraphing and consequently, unlike their writing in the native language, they do not change paragraphs in English writing, even though they change topics. That is, it may be a case of overcautiousness.

Secondly, in the English essays of Korean speakers misleading sentence connection occurs more often than missing sentence connection, while the latter seems more frequent than the former in their Korean essays. This difference might be due to their lack of fluency in English.

Before proceeding to the concluding section, there is one more point to be discussed here: the relation between the difficulty of the task and coherence breaks and between the knowledge of the topic and coherence breaks. More instances of coherence break are found in the writing of the writer who thought the argumentative task difficult or who did not seem to share much knowledge about the topic with the person who had made the questions. In the questions given, as in Appendix 1, Korean speaker 3, who had taken a course in which almost the same task was part of the final examination, marked "very difficult" for the question "How easy or difficult did you find the task?" and "not well" for the question "How well did you know the issues relevant to the topic?" Much more coherence breaks are marked in her writing in Korean than the other two essays in Korean. In addition, many coherence breaks are found in the writing of a Korean speaker in English who was the only one majoring in the field other than

linguistics or TESL. One distinctive feature of the writing is that the writer never used supporting evidence given in the questionnaire. Instead, she wrote arguments with her own evidence. The arguments were not effective enough to convince the reader of her claim, and moreover, the line of reasoning was difficult to follow, as illustrated in the example (6). These caused coherence breaks in her writing. The two Korean speakers' writings thus show that the difficulty of a writing task and the knowledge of the topic affect coherence in the writing.

3. Limitations of the Study

The study has some limitations. First, the analysis relied only on the intuitive judgement of the researcher. Thus, its results would be subjective. One may not agree with the analyst in details of description. The researcher is working on identifying linguistic features marking interactive functions of sentences by using computer analysis. Next, the writing tasks were related only to a specific field: applied linguistics. Consequently, the findings of the study may be register-specific. Finally, the size of the data was not large enough to draw a valid generalization. Thus, one must be cautious in interpreting the results.

4. Summary and Conclusion

The results of the analysis of text structure show that claim + justification + conclusion is a dominant structure in the eleven essays. While this structure was shared by all three native speakers of English, it was illustrated in only one Korean essay and two English essays of Korean speakers. The structure of the Korean essays was not consistent and linear, as compared with that of the English essays of native speakers. The differences between the writing of native speakers of English and Korean were also found among the five English essays of Korean speakers. This suggests that Korean speakers' writing in English is not only influenced by their first language but also the model preferred in English.

In addition to the differences, common features were found in the writing of native speakers of English and Korean: 1) situation and evaluation are the basic interactive acts of the claim unit; and 2) claim, justification and conclusion are the basic components of the test structure. These three features were also noted in the writing of Korean speakers in English. This finding seems to show that there are universal features of argumentative text in English and Korean, and perhaps in language in general.

In the analysis of coherence breaks, four types of coherence breaks were identified besides Wikborg's (1985) categories: misleading lexical items, a lack of information or explanation, a lack of adequate justifying supports and insufficient linking of inductive statements to the preceding discussion. Compared with the writing of native speakers of English, the writing of Korean speakers in Korean had many coherence breaks. This finding suggests two alternative conclusions. The first one is that the

notion of coherence may be different in English and Korean writing. Secondly, coherence breaks are much more tolerable in Korean texts than in English texts. The fact that the notion of coherence presented in English and Korean writing textbooks are not really different (Smalley and Hank, 1982; Suh, 1985) seems to confirm the second; however, further research is needed to draw that conclusion because it is not always true that what a prescriptive textbook says represents what language users really do.

Like the writing of Korean speakers in Korean, there were many instances of coherence breaks in the writing of Korean speakers in English. Furthermore, most of the types of coherence break which occurred most frequently were shared by Korean speakers' writing in their native language as well as in English, although some variations were noted in the subtypes of the most frequent types. The result shows that in the writing of Korean speakers in English, their native language is an important factor influencing the coherence of the text.

As mentioned before, the size of the data was not large enough to draw a valid generalization from all Korean writing and all ESL writing of Korean speakers. Moreover, different structures might have been found if other types of topics (e.g. requiring a solution to a given problem) had been given. Thus, the present study suggests further research on Korean and English argumentative writing of Korean speakers. Since the Korean speakers who participated in the research had been studying in the United States for more than one year, their writing might have been influenced by English; therefore, it is suggested that the writing of Korean speakers in both Korean and English who have not attended any American schools be investigated. Further research might find some culturally preferred pattern, as shown in Kobayashi's (1984) study on English and Japanese rhetorical patterns.

The present study has two pedagogical implications. First, ESL students, including Korean speakers, need instruction in learning the preferred structure in English argumentative text--claim + justification + conclusion--in order to make their writing in English more comprehensible to native speakers of English. Secondly, ESL students, especially Korean learners, must be aware of the importance of logical reasoning in argumentative writing; e.g., the link between the claim and its supporting arguments or between an inductive statement and the preceding discusssion must be made explicit in writing.

NOTES

[1]The definition of "discourse" and "text" varies in the literature. Some people distinguish the two terms, while others do not. As claimed in Stubbs (1983:9), the terms simply imply differences in emphasis, but not theoretical distinction. In this paper, no distinction is made between the term "discourse" and "text." Only for convenience is the term "text" chosen over the term "discourse" in the paper.

[2]In order to find how often the test question which asks students to

write an argumentative answer is requested in American schools and Korean schools, the subjects of the study were asked to mark the frequency in the questionnaire (see Appendix 1). Their answers revealed that argumentative tasks are frequently asked for in American schools and they are more often requested in American schools than in Korean schools.

	Groups of students		
	American students	Korean students	
Place / Frequency	America	America	Korea
Never			
Seldom			2
Sometimes		1	3
Often	2	4	
Always	1		

[3]Halliday and Hasan's (1976) alleged view that cohesion (the formal feature of text) is equivalent to coherence has been criticized by Carrell (1982), Bamberg (1983), Brown and Yule (1983), etc., as ignoring the contributions of non-linguistic features. Furthermore, recent research on the relationship between the two features has revealed that cohesion frequency is not a reliable and valid indicator of writing quality, in other words, coherence (Witte and Faigley, 1981; Connor, 1984; Connor and Lauer, 1985).

[4]A T-unit is an independent clause including all subordinate elements.

[5]Aston (1977: 477-481) divided representatives into three types with respect to the degree to which they convey the writer's commitment to the truth of the expressed proposition. The first type is assertion referring to "acts where the speaker claims that an SA [speech act] is the case"(477). The second is statements referring to "acts where he reports that an SA is the case"(477). The last is reported assertions referring to acts which merely "cite the assertion of others" (480).

[6]The definition listed is the summary of the discussion in Chapter 2 and 3 of Tirkkonen-Condit's dissertation.

*I wish to express my appreciation to Professors Yamuna Kachru and Niko Besnier for their valuable comments on the paper.

APPENDIX 1 Questionnaire*

Instructions

Write an argumentative essay for the given situation. The essay does not have to be typed as long as it is legible. Don't spend more than 50 minutes.

If you are a native speaker of Korean, write in Korean; otherwise, write in English. If it is difficult to translate certain terms such as linguistic relativity, write them in English.

Situation

You are taking a test in a class. The following three questions are given. You have to choose one of them and write a one or two page long answer which clearly presents your position or opinion. Your answer must be more than two paragraphs long.

Note: In order to make the task easier, supporting reasons for pro and con answers are provided after each topic. You can use them in writing the answer.

Topics

1) Sapir and Whorf proposedd the well-known hypothesis of linguistic relativity or linguistic determinism. The hypothesis is: language determines thought or culture to a very great extent and in many ways. Do you agree or disagree with this hypothesis? If you agree, expand the argument citing evidence. If you disagree, develop a couter-argument.

Evidence supporting the hypothesis: English makes use of tenses whereas Hopi does not have tenses; thus, the concept of time is a little different between the speakers of these two languages.

Evidence supporting the counter-argument: a) The physical environment is reflected in a language, especially in the lexicon. For example, English has only one word for snow whereas Eskimo has seven. The reason is that it is essential for Eskimoes to be able to distinguish efficiently between different types of snow.; b) The social environment is reflected in a language. An example is the case where a society's kinship system is reflected in its kinship vocabulary.; c) The values of a society has an effect on its language. For instance, in a language taboo is associated with things which are not said, and in particular with words and expressions which are not used. In practice, of course, this simply means that there are inhibitions about the normal use of items of this kind-if they were not said at all they could hardly remain in the language.
(Reference: Peter Trudgill, Sociolinguistics)

2) In their study of second language acquisition, Dulay and Burt claim that a second language is acquired in essentially the same way as a first language. Although there are obvious differences such as L2 learners already know a language, they are older, etc., Dulay and Burt point out that L1 and L2 acquisition are similar processes of learning; and that L1 and L2 learners' language system is rule-governed and progresses through a series of stages by means of rules that learners formulate and try out for themselves. What is your reaction to Dulay and Burt's argument? If you agree, expand the argument with further evidence. If you disagree, develop a counter-argument.

Similarities between L1 and L2 acquisition: a) The goal is the same-to learn a target language; b) Learning process is guided in L1 acquisition by the particular form of the L1 system and in L2 acquisition by the particular form the L2 system. For example, first language learners acquire their target language in a similar way such as in a similar order and second language learners from various language background acquire certain grammatical structure in a similar order.

Differences between L1 and L2 acquisition: a) L1 acquisition is universal, but L2 acquisition is not.; b) In normal human beings, L1 acquisition always leads to fluency, whereas there is a great degree of variability in the final outcome of L2 acquisition--0 to 100 % of native fluency.;c) age of L1 learners is relatively uniform, but that of L2 learners is various. L2 learners are usually older than L1 learners.; d) L2 learners already know another language, while L1 learners do not have previous linguistic knowledge.; e) all kinds of socio-psychological variables play a crucial role only in second language acquisition--motivation, attitude, empathy, self-esteem, inhibition, extroversion, etc.;f) According to Chomsky, a human being is born with a genetic help to learn a language and this genetic help is available to the first language learner, children. (This claim is related to the critical period hypothesis); g) L1 is not learned by teaching, whereas L2 acquisition for most people takes place under formal instruction. (Reference: Dulay, Burt and Krashen, Langauge Two; H.D. Brown, Principle of Language Learning and Teaching)

3) The behavioristic model of first language acquisition claims that "the child comes into the world with a tabula rasa, a clean slate bearing no preconceived notions about environment, slowly conditioned through various schedules of reinforcement." Assume you agree with the nativistic approach and write an argument against the behavioristic approach.

Evidence against the behavioristic approach to L1 acquisition: a) The behavioristic approach claims that children learn their first language by imitating adult speech, but children do not just imitate adult speech. For example, children utter ungrammatical sentences which their parents have never said, e.g. "a my pencil," "Nobody didn't come," etc.; b) Overgeneralization made by L1 learners supports that the learners formulate a rule with the language input they receive in stead of imitating adult speech.; c) A child utters a novel sentence which he has never heard before. This creativity cannot be explained by the behavioristic approach.; d) A human language is too complex for a child to learn by conditioning learning in a short time.

1. How familiar are you with the kind of writing task you have just completed: a task which aska you to write an argumentative answer?

   a. Not familiar at all
   b. Familiar to some extent
   c. Very familiar

2. How often do you have the type of the test questions given in the task in American schools?

   a. Never
   b. Seldom
   c. Sometimes
   d. Often
   e. Always

3. If you are Korean, how often did you have the type of the test questions in the task in Korean schools?

   a. Never
   b. Seldom
   c. Sometimes
   d. Often
   e. Always

4. How easy or difficult did you find the task?

   a. Difficult
   b. Relatively difficult
   c. Neither easy nor difficult
   d. Relatively easy
   e. Easy

5. How interesting did you find the task or topic?

   a. Uninteresting
   b. Relatively uninteresting
   c. Neither interesting nor uninteresting
   d. Relatively interesting
   e. Interesting

6. How well did you know the issues relevant to the topic?

   a. Not well
   b. To some extent
   c. Very well

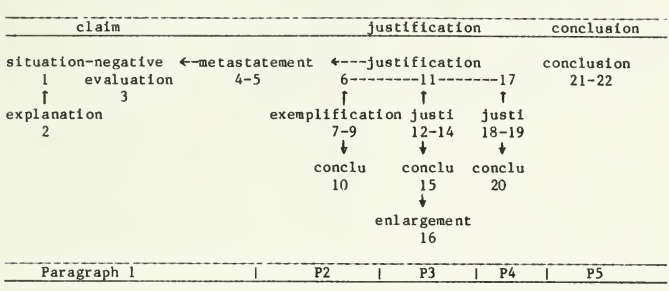
Write any comments on the writing task or the topics.

---

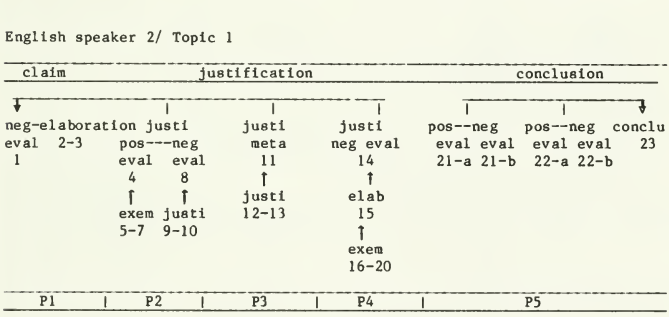
*It is a part of the original questionnaire which contains the instructions for the writing tasks and the questions asked after writing

APPENDIX 2: The deacription of text structure*

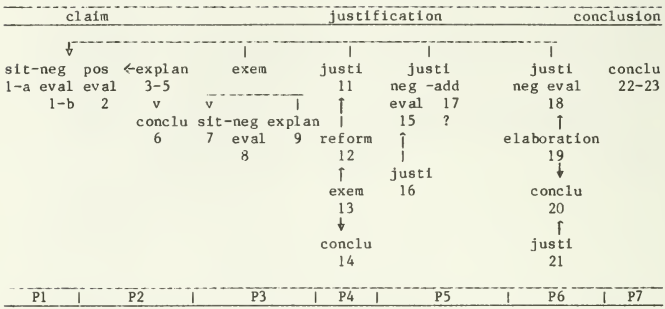
English speaker 1/ Topic 1



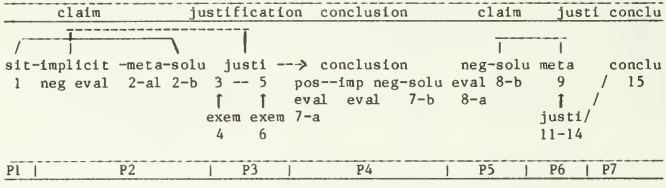
English speaker 2/ Topic 1



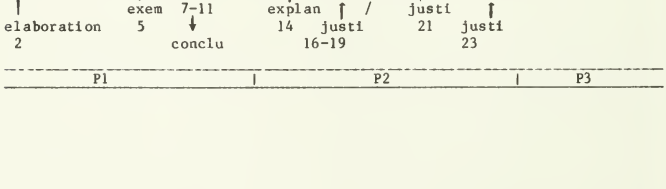
English speaker 3/ Topic 3



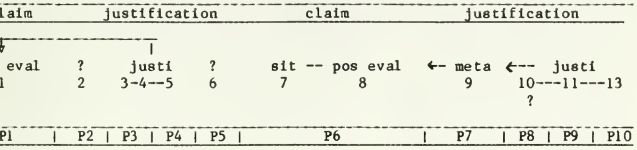
Korean speaker 1/ Topic 1



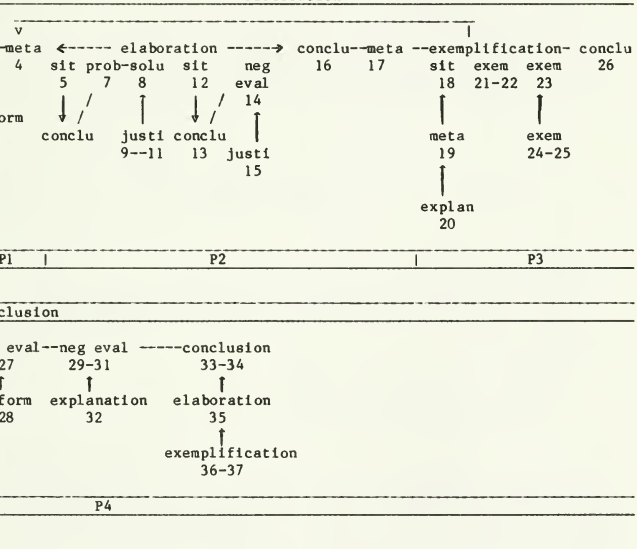
Korean speaker 2/ Topic 1



Korean speaker 3/ Topic 3



Korean speaker 4/ Topic 1



Korean speaker 5/ Topic 1

claim	justification	conclusion
neg eval 1	←-meta 2	←- justi sit 3 conclu 5-6-7 exem 4	conclu 8-10
P1	P2	P3	P4

Korean speaker 5/ Topic 2

claim	justification
sit-eval 1	2	? 3-6	? 7-11
P1	P2	P3

Korean speaker 5/ Topic 3

claim		claim	conclusion
neg eval 1	←metastatement→ 2	pos eval 3 reformulation 5 - 6	neg eval 4	--> conclusion 5 elaboration 10--11
P1		P2	P3

Korean speaker 6/ Topic 2

claim			justification			conclusion	
neg eval 1	pos---neg eval 2-a	eval 2-b	←------- 3 elab 4 exem 6-7 ?	justification - eval 5	neg eval 8 justi 9	---------> neg 10	conclusion--addition 11	12
Paragraph 1							Paragraph 2	

*Numbers in diagrams refer to T-units and alphabet letters attached to the T-unit numbers indicate subparts of the T-unit; question marks indicate the T-unit whose interactive role is not clear.

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A PHONETIC MODEL FOR READING: EVIDENCE FROM KOREAN

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It is hypothesized that, as in speech production and perception, reading is also processed in terms of the size of syllables rather than individual segments. In order to test this hypothesis, a reading experiment was conducted on the "readability" of the Korean script **Hangul**, which is alphabetic (phonemic) but is written in syllable blocks in the standard orthography. The experiment involved two modes of reading: syllabic and "deblocked" alphabetic, and Korean language learners at several levels from beginning to advanced. It was found that at all levels of learners, the syllabic writing was read faster and with less hesitation by the factor of 1 : 2, thus supporting the hypothesis. A brief discussion on the implications of this finding in teaching reading follows.

1. Introduction

A phonetic theory, postulated from many indications, has it that speech perception, as well as speech production, is processed in terms of the size of syllables, not phonemes (cf. Ladefoged 1967). Although reading is a form of visual, not aural, perception, the phonetic model, if correct, suggests that reading may also be processed in syllable chunks, not by spotting phonemes (or the equivalent orthographic letters) individually. We are assuming here that there is a point at which both hearing and reading converge when the brain decodes (processes) the speech input.

We would like to present some evidence to corroborate this hypothesis from Korean. We felt that the Korean script (called **Hangul**) presents an ideal testing ground, for although **Hangul** is a phonemic writing system is written in terms of "syllable blocks", for example,

Standard (syllabic)

"vertical" vowels	산 san	길 kil	`mountain trail'
"horizontal" vowels	손 son	금 kɨm	`palm lines'

We conducted an experiment that involved what one might call "deblocking" or linearizing the script, for example,

Linear (alphabetic)

ㅅㅏㄴㄱㅣㄹ
s a n k i l

ㅅㅗㄴㄱㅡㅁ
s o n k ɨ m

The assumption was that the effect of this desyllabification or alphabetization (linearization) of the Korean script on reading efficiency by learners of beginning Korean should be evident, given the hypothesis mentioned earlier.

2. Experiment

24 tokens of the following types were selected evenly according to the vowel shape, (vertical and horizontal vowel shapes) and their syllable structure patterns (CV, VC, CVC, CVCV, and VCV) because those tokens that consist only of the vertical vowels do not provide a significant difference in the two writing modes we are discussing. (See Appendix for tokens)

Among these 24 tokens, those in the set A are the isolated words and those in the set B are the sentences (three of which are common expressions). See the following Table 1.

20 subjects were selected equally from the level 1, 2, 3, and 4. The student from the level 1 were exposed to **Hangul** for only 3 months in the elementary Korean course at the University of Illinois. The level 2 students are from the third semester class, the intermediate course, and the level 3 students are from the fifth semester class, the advanced course at the University of Illinois. The students in the level 4 are near-native Koreans who read Korean **Hangul** as fluently as Korean secondary school students.

Each subject read the tokens in two modes--the standard syllabic mode first and then the linear mode--in a sound-proofed recording booth. The subject was not accompanied by anyone during the recording.

The total length of each token was measured with a chronometer for all speakers, and the values include inter-token pauses.

Table 1. Syllable structure of tokens

			#of syll.	#of seg.
A. 1.	V-CV or CV-CV	vertical vowels	16	30
2.	V-CV or CV-CV	horizontal & vertical	16	32
3.	CV-CV or V-V	horizontal vowels	16	33
4.	CVC-CV or CVC-V	vertical vowels	16	39
5.	CV-CVC	vertical vowels	16	43
6.	CVC-CVC	vertical vowels	16	49
7.	CVC-CV	horizontal vowels	16	40
8.	CV-CVC	horizontal vowels	16	41
9.	CVC-CVC	horizontal vowels	16	49
10.	CV-CV-CV	horizontal & vertical	24	48
11.	mixed polysyllables with simple vowel nuclei	mixed	34	96
12.	mixed polysyllables with complex vowel nuclei	mixed	35	92
B. 1.	sentence with mixed vowels		8	17
2.	sentence with mixed vowels		10	23
3.	sentence with mixed vowels		6	17
4.	sentence with mixed vowels		7	18
5.	sentence with mixed vowels		9	21
6.	sentence with mixed vowels		9	23
7.	sentence with mixed vowels		5	14
8.	sentence with mixed vowels		8	18
9.	sentence with mixed vowels		11	24
10.	sentence with mixed vowels		10	22
11.	sentence with mixed vowels		15	34
12.	sentence with mixed vowels		20	45
		Total:	355	868

3. Discussion

Table 2 below shows the average length of each set (sequence) for all speakers. The values include inter-token pauses, if any. The total average length for all 24 tokens for all speakers was 199 sec. (3 min. 19 sec.) in the syllabic mode but 491 sec. (8 min. 11 sec.) in the alphabetic mode. That is, the alphabetic mode was 2.5 times slower than the syllabic mode for all speakers. The average syllable length was .56 sec. in the syllabic mode but 1.38 sec. in the alphabetic mode and the average segment length was .23 sec. in the syllabic mode, but .56 sec. in the alphabetic mode.

Table 2. Average length for all speakers (numbers are in seconds)

	standard (syllabic)	linear (alphabetic)
total length	199	491
syllable	.56	1.38
segment	.23	.56

Table 3 shows the average length of a syllable and of a segment for each level of proficiency. As can be seen in the table, both the average duration of a syllable and the average duration of a segment decrease progressively from level 1 to 4. This is true in both modes of writing. However, the rate of the decrease was much steeper in the syllabic mode than in the alphabetic mode. For example, while the level 4 students were 3 1/2 times faster than the level 1 students in the syllabic mode (.3 sec. vs. 1.06 sec. in the average syllable length), they were only 2 times faster in the alphabetic mode (.85 sec. vs. 1.77 sec. in the average syllable length), indicating that the apparent advantages such as familiarity with the words and comprehensibility of the sentences did not play as great a role in the alphabetic mode as in the syllabic mode, thus reducing the rate of fluency in the former.

Table 3. Average length for each level

level	syll/seg	standard	linear
1	syll	1.06	1.77
	seg	.44	.73
2	syll	.54	1.74
	seg	.22	.71
3	syll	.34	1.18
	seg	.14	.48
4	syll	.3	.85
	seg	.12	.35

Table 4 compares the average duration of a syllable containing a vertical vowel with that of a syllable containing a horizontal vowel. While a vertical vowel is written to the right of the onset consonant, a horizontal vowel is written below it in the syllable writing mode. Thus there is a greater difference in word shapes in the latter than in the former when the syllabic script is recoded into the alphabetic mode. One can then expect that there will be a much greater time differential between the syllabic mode and the alphabetic mode involving the horizontal vowels than in the case involving the vertical vowels. This expectation is borne out well in the result. Note first of all that, in the syllabic mode, there is hardly any difference in the average duration of a syllable between the vertical and the horizontal vowels at every level. But in the alphabetic mode, while the syllable with a vertical vowel is less than twice as long as the same in the syllabic mode, it is nearly 3 times longer in the case of a horizontal vowel. Thus once again the linearization of the syllable blocks appears to hinder the reading to a considerable extent.

Table 4. Average syllable length: vertical vowel vs. horizontal vowel

level	Vertical V		Horizontal V	
	standard	linear	standard	linear
1	1.19	1.74	1.3	2.36
2	.66	1.19	.68	2.8
3	.41	.82	.48	1.42
4	.36	.67	.43	1.39
average	.66	1.1	.72	2.0

Table 5 compares the average syllable length of isolated words in the set A with that of sentences in the set B. One may hypothesize not only that the syntactically concatenated words in the set B will be read faster than the isolated words arranged in a random order in the set A (since affixes are shorter vis-a-vis free morphemes of the same number of syllables/segments, and since contextual cues facilitate the reading, and they are absent in the set A), but also that the higher the level of fluency of a reader/speaker, the greater the differential between the two modes of reading/writing, since comprehensibility of the sentences plays a lesser role for the lower level speaker/reader than for the higher level speaker/reader. This will be especially true in the familiar (fixed) phrases and expressions such as B.1, 3, and 7. (B.1 is a part of a line of a well-known poem, and B.3 and 7 are frequently used expressions.) Again the results are in conformity with these hypotheses. The average syllable length is shorter in the set B than in the set A for all levels and modes, and the differential between the two modes of writing/reading is progressively greater at higher levels.

Table 5. Average syllable length: isolated words (A) vs. sentences(B)

level	A		B	
	standard	linear	standard	linear
1	1.18	1.78	.86	1.77
2	.68	1.81	.34	1.59
3	.39	1.18	.23	1.17
4	.36	.92	.2	.72
average	.65	1.1	.4	.81

4. Conclusion

The experiment has shown, in every possible parameter of measurements, that the linear reading is more difficult than the syllabic reading. We realize that the results are a bit skewed in view of the fact that in the case of more advanced level subjects, it may be not so much the deblocking of the script as the familiarity with the standard syllabic script that hindered their reading. (This factor can be corrected to some extent by using nonsense words or by choosing only naive beginning students as subjects, and by giving them a two-way training, i.e. by teaching students to read alphabetically as well as syllabically.)

Nevertheless, it is significant to note that even in the level 1 case,

there was more frequent and longer hesitation in the linear mode than in the syllabic mode. One German student in the level 1 gave the following uninvited comment when frustrated trying to read the alphabetized **Hangul**. "This is stupid." When it was pointed out that the German script is just as alphabetic and linear, he could only stammer, "Well, but....."

It is sufficient at this point to cite one interesting experiment. In a brief article in Science, Rozin et al (1971) reported an experiment which showed that American children with reading problems could easily learn to read English when represented in Chinese characters. 8 to 9 year old experimental children were chosen for their reading deficiency. "They had difficulty in identifying words by initial or final sounds and in combining sequence of letters into a known English word", and "were unable to read reliably a set of rhyming words (cat, fat, mat, sat) after being given the pronunciation of at." Yet after a few hours of training in which they learned Chinese characters representing some English words they could read quite easily the sentences of these characters (e.g., `father bought a black car'). The authors hypothesize that reading disability in the case of sentences written in the English alphabet is largely accountable in terms of the highly abstract nature of the phoneme, while facility in the case of sentences represented in Chinese characters is on the account of the fact that Chinese characters map into speech at the level of syllables and words rather than at the level of phonemes or alphabetic letters, as is the case in English, and propose the unit of the syllable as the most suitable vehicle for teaching reading.

From a private conversation with Professor S. Makino, a Japanese linguist, it has been learned that the same result as ours was obtained from an experimental study on the Japanese **Kana** script.

The fact that the earliest and first writing systems in the history of human civilization were all syllabic assumes a new air of credibility and credit in the light of the above discussion.

The implication of the above finding in the teaching of reading is fairly clear. The reason why Johnny can't read is because reading is taught in the Sesame Street style.*

NOTES

*This paper was presented at the Annual Meeting of the Linguistic Society of America, December 1983, Minneapolis, MN, and at the Conference on the Korean Language and Linguistics, April 1984, University of Southern California, Los Angeles, CA.

Appendix

I. Standard(syllabic)

A-1 아래, 어디, 아마, 여자, 가다, 시계, 거리, 기차

A-2 우리, 오다, 요새, 유리, 모래, 수녀, 누나, 교사

A-3 모두, 누구, 호두, 두부, 교수, 도로, 규소, 우유

A-4 연기, 망치, 길이, 전기, 팽이, 장마, 명사, 감기

A-5 벼랑, 가난, 저녁, 자랑, 하직, 마찰, 며칠, 바람

A-6 방법, 건강, 전진, 발달, 영감, 달걀, 친절, 선생

A-7 료소, 근무, 본부, 분초, 효로, 공부, 굘수, 촌수

A-8 추곡, 교육, 고뮬, 보름, 모순, 유순, 요동, 고분

A-9 혼돈, 근본, 중국, 본분, 촛불, 효륭, 굘몰, 충분

A-10 그리고, 지우개, 마무리, 고구마, 자루리, 가로수, 모서리, 바구니

A-11 한국말, 백두산, 만년필, 대통령, 불란서, 중국말, 수륙만리, 대한민국, 팔도강산, 국무총리

A-12 백화점, 교과서, 도서관, 지휘관, 위원장, 외국어, 회의실, 되도록, 뒤안길, 외무회의, 국회의원

B-1 넋이라도 있고 없고.

B-2 올바른 삶이 무엇입니까?

B-3 실례했읍니다.

B-4 밝은 달이 뜹니다.

B-5 운동을 많이 했읍니다.

B-6 늙은 숫사슴이 뿔입니다.

B-7 괜 찮습니다.

B-8 여기는 교실이예요.

B-9 우리는 한글을 읽고 또 써요.

B-10 도서관에는 책이 있어요.

B-11 한주일의 첫째날은 무슨 요일입니까?

B-12 지금 백화점에 같이 갔다 오다가 집으로 갔읍니다.

Ⅱ. Linear(alphabetic)

A-1 ㅇㅕㅈㅏ, ㅇㅏㄹㅐ, ㅇㅓㄷㅣ, ㅇㅏㅁㅏ, ㄱㅏㄷㅏ, ㅅㅣㄱㅖ, ㄱㅓㄹㅣ, ㄱㅣㅊㅏ

A-2 ㅇㅜㄹㅣ, ㅇㅗㄷㅏ, ㅇㅛㅅㅐ, ㅇㅠㄹㅣ, ㅁㅗㄹㅐ, ㅅㅜㄴㅕ, ㄴㅜㄴㅏ, ㄱㅛㅅㅏ

A-3 ㅁㅗㄷㅜ, ㄴㅜㄱㅜ, ㅎㅗㄷㅜ, ㄷㅜㅂㅜ, ㄱㅛㅅㅜ, ㄷㅗㄹㅗ, ㄱㅠㅅㅗ, ㅇㅜㅇㅠ

A-4 ㅇㅕㄴㄱㅣ, ㅁㅏㅇㅊㅣ, ㄱㅣㄹㅇㅣ, ㅈㅓㄴㄱㅣ, ㅍㅐㅇㅇㅣ, ㅈㅏㅇㅁㅏ, ㅁㅕㅇㅅㅏ, ㄱㅏㅁㄱㅣ

A-5 ㅂㅕㄹㅏㅇ, ㄱㅏㄴㅏㄴ, ㅈㅓㄴㅕㄱ, ㅈㅏㄹㅏㅇ, ㅎㅏㅈㅣㄱ, ㅁㅏㅊㅏㄹ, ㅁㅕㅊㅣㄹ, ㅂㅏㄹㅏㅁ

A-6 ㅂㅏㅇㅂㅕㅂ, ㄱㅓㄴㄱㅏㅇ, ㅈㅓㄴㅈㅣㄴ, ㅂㅏㄹㄷㅏㄹ, ㅇㅕㅇㄱㅏㅁ, ㄷㅏㄹㄱㅑㄹ, ㅊㅣㄴㅈㅓㄹ, ㅅㅓㄴㅅㅐㅇ

A-7 ㅁㅜㄹㅅㅗ, ㄱㅡㄴㅁㅜ, ㅂㅅㄴㅂㅜ, ㅂㅜㄴㅊㅗ, ㅎㅗㄹㄹㅗ, ㄱㅗㅇㅂㅜ, ㄱㅗㄹㅅㅜ, ㅊㅗㄴㅅㅜ

A-8 ㅊㅜㄱㅗㄱ, ㄱㅛㅇㅠㄱ, ㄱㅗㅁㅜㄹ, ㅂㅗㄹㅡㅁ, ㅁㅗㅅㅜㄴ, ㅇㅠㅅㅜㄴ, ㅇㅛㄷㅗㅇ, ㄱㅗㅂㅜㄴ

A-9 ㅎㅗㄴㄷㅗㄴ, ㄱㅡㄴㅂㅗㄴ, ㅈㅜㅇㄱㅜㄱ, ㅂㅗㄴㅂㅜㄴ, ㅊㅗㅅㅂㅜㄹ, ㅎㅜㄹㄹㅠㅇ, ㄱㅗㄹㅁㅗㄹ, ㅊㅜㅇㅂㅜㄴ

A-10 ㄱㅡㄹㅣㄱㅗ, ㅈㅣㅇㅜㄱㅐ, ㅁㅏㅁㅜㄹㅣ, ㄱㅗㄱㅜㅁㅏ,
ㅈㅏㅌㅜㄹㅣ, ㄱㅏㄹㅗㅅㅜ, ㅁㅗㅅㅓㄹㅣ, ㅂㅏㄱㅜㄴㅣ

A-11 ㅎㅏㄴㄱㅜㄱㅁㅏㄹ, ㅂㅐㄱㄷㅜㅅㅏㄴ, ㅁㅏㄴㄴㅕㄴㅍㅣㄹ,
ㄷㅐㅌㅗㅇㄹㅕㅇ, ㅂㅜㄹㅓㅏㄴㅅㅓ, ㅈㅜㅇㄱㅜㄱㅁㅏㄹ,
ㅅㅜㄹㅠㄱㅁㅏㄴㄹㅣ, ㄷㅐㅎㅏㄴㅁㅣㄴㄱㅜㄱ,
ㅍㅏㄹㄷㅗㄱㅏㅇㅅㅏㄴ, ㄱㅜㄱㅁㅜㅊㅗㅇㄹㅣ

A-12 ㅂㅐㄱㅎㅘㅈㅕㅁ, ㄱㅗㄱㅘㅅㅓ, ㄷㅗㅅㅓㄱㅘㄴ,
ㅈㅣㅎㅓㄱㅘㄴ, ㅇㅓㅜㅓㄴㅅㅏㅇ, ㅇㅓㄱㅜㄱㅇㅓ,
ㅎㅓㅇㅓㅅㅣㄹ, ㄷㅓㄷㅗㄹㅗㄱ, ㄷㅓㅇㅏㄴㄱㅣㄹ,
ㅇㅓㅁㅜㅎㅓㅇㅓ, ㄱㅜㄱㅎㅓㅇㅓㅜㅓㄴ

B-1 ㄴㅓㅆㅇㅣㄹㅏㄷㅗㅇㅣㅆㄱㅗ ㅇㅕㅆㄱㅗ.

B-2 ㅇㅗㄹㅂㅏㄹㅡㄴ ㅅㅏㅛㅇㅣ ㅁㅜㅇㅕㅅㅇㅣㅂㄴㅣㄲㅏ?

B-3 ㅅㅣㄹㄹㅔㅎㅐㅆㅇㅡㅂㄴㅣㄷㅏ.

B-4 ㅂㅏㅋㅇㅡㄴ ㄷㅏㄹㅇㅣ ㅠㅡㅂㄴㅣㄷㅏ.

B-5 ㅇㅜㄴㄷㅗㅇㅇㅡㄹ ㅁㅏㅿㅇㅣ ㅎㅐㅆㅇㅡㅂㄴㅣㄷㅏ.

B-6 ㄴㅡㅋㅇㅡㄴ ㅅㅜㅅㅅㅏㅅㅡㅁㅇㅣ ㅠㅝㅂㄴㅣㄷㅏ.

B-7 ㄱㅐㄴㅊㅏㅿㅅㅡㅂㄴㅣㄷㅏ.

B-8 ㅇㅕㄱㅣㄴㅡㄴ ㄱㅛㅅㅣㄹㅇㅣㅇㅖㅇㅛ.

B-9 ㅇㅜㄹㅣㄴㅡㄴ ㅎㅏㄴㄱㅡㄹㅇㅡㄹ ㅇㅣㅋㄱㅗ ㅁㅗ ㅆㅓㅇㅛ.

B-10 ㄷㅗㅅㅓㄱㅘㄴㅇㅔㄴㅡㄴ ㅊㅐㄱㅇㅣ ㅇㅣㅆㅇㅓㅇㅛ.

B-11 ㅎㅏㄴㅈㅜㅇㅣㄹㅇㅓㄱ ㅊㅓㅅㅆㅐ ㄴㅏㄹㅇㅡㄴ ㅁㅜㅅㅡㄴ ㅇㅛ
ㅇㅣㄹㅇㅣㅂㄴㅣㄲㅏ?

B-12 ㅈㅣㄱㅡㅁ ㅂㅐㄱㅎㅘㅈㅕㅁㅇㅔ ㄱㅏㅌㅇㅣ ㄱㅏㅆㄷㅏ ㅇㅗ
ㄷㅏㄱㅏ ㅈㅣㅂㅇㅡㄹㅗ ㄱㅏㅆㅇㅡㅂㄴㅣㄷㅏ.

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THE KOREAN WRITING SYSTEM: A LINGUISTIC EXAMINATION

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The native Korean script called hangul invented in the 15th century is given a modern linguistic examination and interpretation. After pointing out its virtues and vices, it is concluded that the inventor had a remarkable insight into modern linguistic theories such as the concept of syllable, phoneme, vowel harmony, and distinctive features, the only possible weakness being the practice of a phonemic, rather than, morphophonemic, writing system.

The recorded literature of old Korea hints that some kind of writing was known in ancient Korea before the introduction of Chinese ideography (Y. Kim 1962). Writing as a systematic practice, however, was established after the introduction of the Chinese system of writing in the early seventh century. From its introduction, the Chinese system of writing was the only means of writing in Korea until the invention of the present Korean alphabet in the 15th century. The subsequent influence of the Chinese language upon Korean was so great that the Korean language has become a hybrid language with a dual strain of Chinese and the original native language running through its vocabulary.

Before the invention of the Korean alphabet, two syllabic writing systems, idu and kugyol, were derived from the Chinese ideography by adapting some of Chinese characters to Korean pronunciation. idu is believed to have been developed in the 6th century (Y. Kim 1962). Many of the poems of Silla dynasty (57 B.C. - 935 A.D.) were written in idu and have been preserved. idu, however, did not develop into a system of syllabary comparable to that of Japanese, although they both had a similar origin. kugyol, which was developed in the 14th century (Y. Kim 1962), was used to weld the grammatical structure of the Chinese language, which is characteristically isolating, to the highly agglutinative system of the Korean language, by serving as grammatical particles. This function of kugyol was later replaced by the new phonetic alphabet in the 15th century.

The new system of 28 alphabetical letters was officially promulgated upon the publication of Hunmin-chong'um ('the standard writing for the people') in 1446. It is significant

that the new system of writing which made a complete departure from the Chinese system of writing was made at a time when admiration and learning of Chinese classical scholarship reached its apogee of flourishment. King Sejong, who has been credited as the inventor of the new writing system, proclaimed in the preamble of Hunmin-chong'um that the new script was made to provide the means of writing for the common people and to provide a suitable means of transcribing the Korean language -- a task for which Chinese characters were not suited. The new alphabet, which was originally called Hunmin-chong'um and later hangul by popular abbreviation, soon became widespread, espeically among the common people, and has since been established as the native writing system. The following and continued success of this new writing system, despite the adverse cultural environment in which the authority and prestige of Chinese characters were enormous, has been largely attributed to the high adaptability and simplicity of the writing system.

However, the alleged excellence of the writing system has been little supported by systematic and scientific study. Past studies of hangul have been devoted mainly to the investigation of the origin of the shape of the letters. This is a marginal, if not an irrelevant, problem to the student of linguistics. A new system of phonetic alphabet of a language cannot be made without being based on some form of phonological analysis of the language. Therefore the investigation of the phonological analysis of 15th century Korean, which must have preceded the making of the new alphabet, and the way the analysis was represented in the new system should be given the first priority in the study of hangul as a system of writing.

The problems involved in the systematic representation of language are among the controversial issues of linguistics today. An attempt is made in the paper to investigate the phonological analysis underlying the 15th century Korean orthography and to evaluate the system of its representation in light of modern theories advanced for the systematic representation of language.

The original sources for the study of the system of hangul are limited to Hunmin-chong'um and Haerye ('explanations and examples'). The former, written by King Sejong himself, consists of three parts: Preamble, Description of Letters, and Uses of Letters. Haerye, written by Chong In-ji, a famous hangul scholar, consists of five parts: Letters, Initials, Medials, Combinations of Letters, and Uses of Letters. It was published as a part of Hunmin-chong'um, and contains fairly comprehensive explanations of the shapes of letters, articulatory features of the sounds represented by the letters and the rules for typographical combination of letters into characters.[1]

Explanatoins in Haerye show that hangul scholars recognized the syllable as a basic unit for analysis of the sound system. The syllable was identified first and then analyzed into initial, medial, and final song.[2] The syllable was clearly represented in the orthography as a character. A character, in principle,

consisted of three letters, each representing an initial, medial, and final phone.[3] The discussion of the system of Hunmin-chong'um in Haerye was made in terms of the initial, medial, and final phones.

It has been argued that recognition of the syllable as a significant unit of phonological structure was due to the influence of Chinese phonology which took the syllable as its foundation. The influence of Chinese phonology upon the system of hangul is most clearly seen in the system of initial consonants, which was analyzed as composed of 23 units. The consonant system of Hunmin-chong'um can be represented as in the following chart.[4]

Manner of articulation \ Place of articulation		Bilabial	Alveolar	Palatal	Velar	Glottal
Stops	lenis, unaspir.	ㅂ p	ㄷ t		ㄱ k	
	lenis, aspir.	ㅍ p'	ㅌ t'		ㅋ k'	
	fortis, unasp.	ㅃ p"	ㄸ t"		ㄲ k"	
Affric.	lenis, unaspir.			ㅈ c		
	lenis, aspir.			ㅊ c'		
	fortis, unasp.			ㅉ c"		
Fric.	lenis, voiceless		ㅅ s			ㆆ h
	fortis, voiceless		ㅆ s"			ㅎ x
	lenis, voiced		ㅿ z			ㅇ ?
Nasals		ㅁ m	ㄴ n		ㆁ ŋ	
Trill			ㄹ r			

In reducing these 23 consonants to letters, the hangul scholars used a unique and unprecedented technique. They first selected five basic phones, one from each of five articulatory points: bilabial, alveolar, palatal, velar, and glottal. These five basic phones were represented by the letters whose shapes were modeled after the shapes of the articulatory organs used in producing these phones. The rest of the consonants of homorganic series were represented either by adding diacritics to the basic letters or by juxtaposing the basic letters. Haerye gives the following explanation on the shapes of the basic letters:

ㄱ/k/ depicts the root of the tongue closing the oral passage;
ㄴ/n/ depicts the tip of the tongue touching the upper ridge of the teeth;
ㅁ/m/ depicts the shape of the mouth;
ㅅ/s/ depicts the shape of a tooth;
ㅇ/ø/ depicts the shape of the throat.

Haerye's explanation of the shapes of the letters can be summarized as in the following table:

	base letters	letters formed with diacritics	letters juxtaposed	special letter
velar	ㄱ /k/	ㅋ /k'/	ㄲ /k"/	ㆁ /ŋ/
alveolar	ㄴ /n/	ㄷ /t/ ㅌ/t'/ ㄹ/r/	ㄸ /t"/	
labial	ㅁ /m/	ㅂ /p/ ㅍ/p'/	ㅃ /p"/	
sibilant	ㅅ /s/	ㅈ /c/ ㅊ/c'/ ㅿ/z/	ㅆㅉ/s"/ㅆ/s"/	
glottal	ㅇ /ø/	ㆆ /?/ ㅎ/h/	ㆅㆆ /x/	

The most lenis phone among the phones of homorganic series was chosen as the basic phone. One exception is ㄱ/k/, the base phone of the velar series. Haerye says that ㄴ /n/, which is produced through the nose, with the oral passage closed by the tongue, is frequently confused with ㅇ /ø/ even in Chinese phonology. ㄱ/k/ was chosen as the base form, instead of ㆁ/ŋ/, to prevent the confusion. This explanation is significant in that it shows that the hangul scholars correctly understood the sound producing mechanism and they were concerned with unambiguous representation of the sound system.

Haerye classifies the 23 initial phones in terms of their place of articulation and their quality (distinctive features in modern terms). It can be summarized as in the following table:[5]

Quality \ Place	labial	dental	lingual	velar	glottal
purest(unasp.)	ㅂ p	ㅅ s ㅈc	ㄷ t	ㄱ k	ㆆ ?
pure (aspir.)	ㅍ p'	ㅊ c'	ㅌ t'	ㅋ k'	ㅎ h
thick (tense)	ㅹ p"	ㅆ s" ㅉ c"	ㄸ t"	ㄲ k"	ㆅ x
neither pure nor thick	ㅁ m		ㄴ n	ㆁ ŋ	

The preceding discussion shows that hangul scholars' understanding of the system of initial consonants was basically correct even from the viewpoint of modern linguistic science. They ingeniously represented the system with letters which showed the articulatory mechanism and the systematic relationship among the consonants. However, there are a few weaknesses in their system and classification of initial consonants. Their descriptive system did not provide adequate means of description and classification of all the distinctive phones in the language. ㅅ /s/ and ㅈ /c/, ㅆ /s"/ and ㅈㅈ/c"/, which are analyzed and represneted as disinctive units, are grouped into one and the same classificatory category. This is caused by the incompleteness of the descriptive system, namely the lack of continuant/interrupted feature.

This incompleteness of the descriptive system was mainly due to the hangul scholars' heavy reliance on the Chinese system of phonology. Chinese phonology then known to hangul scholars had a system of 31 initials and classified them with basically the same

descriptive system in which 23 initials of Hunmin-chong'um were classified (Lee 1964). It is very probable that hangul scholars used the Chinesee system of 31 initials as the basis of their analysis. They might have examined Korean pronunciation of Chinese initials and established the Korean system of 23 initials. This probability is supported by the fact that Tongguk-chong'un ('a standard dictionary of rhymes'), which was published in 1448 to standardize Sino-Korean pronunciation, had exactly the same system of initials (Lee 1964).

The most serious weakness of Hunmin-chong'um, which came from the influence of Chinese phonology, was that the system of initials included units which did not exist in contemporary Korean. These units are ㅿ/z/ and ㆆ/ʔ/. A historical study shows that these units were introduced to transcribe the standardized "correct" pronunciation of Chinese characters (Huh 1960).

The phonetic description of the zero consonant marker has long been a matter of controversy. ㅇ/ø/ was described in Haerye as a "transparent and void" sound. The writer follows those Korean linguists who maintain that the unit had no phonetic reality (Huh 1960). hangul aholcars thought that every syllable began and ended with a consonant. And they analyzed a syllable which began with a vowel as preceded by a "void" (ghost) consonant ㅇ/ø/. Although it has generally been considered that the "void" /ø/ was one of the weaknesses of Hunmin-chong'um, the writer believes that this is an achievement of high linguistic aophistication. This establishment of the void consonant can be understood in terms of hangul scholars' concept of the linsutiatic syatem as a symmetrical and harmonic entity. By establishing the zero consonant, (1) the pattern congruity of the glottal series was achieved by eliminating a hole in the pattern, (2) the concept of the uniform pattern of syllable structure was maintained, and (3) typographical symmetry and consistency in the shape of characters were achieved. The zero consonant letter aerved both linguistic and orthographical necessities, that of simple and symmetrical description of the system and that of consiatency of graphic formation.

A significant achievement of hangul phonology over the Chinese system of analysis waa the tri-partite division of the syllable. This analysia of syllable structure coincides with the modern analysis of syllable into three constitutents: an onset, a peak (a nucleus), and a coda. Chinese phonology employed a bi-partite division --- syllable-initial and syllable-final --- creating a highly complicated system of syllable-finals (Lee 1964). According to Chinese phonology, the Sino-Korean /kak/ 'horn', for example, would be analyzed aa a syllable-initial /k/ and a syllabel-final /ak/. The tri-partite diviaion of the syllable laid a foundation for the success of Hunmin-chong'um aa a phonetic writing system.

Moreover, hangul acholars discovered the phonemic identity of syllable-finals with syllable-initials. The fact they reused the letters for initial consonants to represent final consonanta

proves their perception of the identity. If they had failed to recognize the phonemic identity of syllable-finals with syllable-initials, hangul scholars would have ended up with the unphonemic result of giving separate letters for identical initials and finals. The tri-partite division of the syllable and the discovery of the identity of initials and finals, then, were the key factors which made the new system a truly phonemic writing system.

The use of consonant letters in the syllable-final position was limited to eight letters: ㄱ/k/, ㄴ/n/, ㄷ/t/, ㅂ/p/, ㅇ/m/, ㅅ/s/, ㄹ/r/, and ㆁ/ŋ/. Haerye says: "initial letters are reused to transcribe final phones, but eight letters are enough for that purpose." From the viewpoint of modern phonological analysis, this statement can be interpreted as a statement on the distribution of consonants in the syllable-final position. hangul schoalrs analyzed the occurrence of consonants in the syllable-final position as limited to these eight consonants and represented them accordingly. The reason for analyzing syllable-finals into a system of only eight consonants was, as Haerye says, "that, though the consonants of 곶 /koc/ 'flower' and 갗 /kac'/ 'skin' are ㅊ and ㅉ respectively, they can be represented with ㅅ /s/." Although this statement is made in a very simple and linguistically unsophisticated way, it defines the basic characteristics of Hunmin-chong'um as a writing system --- a system which gives one letter per sound. It says, in modern terms, that the opposition or the contrast between ㅊ /c/, ㅉ /c'/, and ㅅ /s/ is neutralized in the syllable-final position and that these sounds are produced as ㅅ /s/. It also means that only those sounds which contrast phonemically are represented in the system of writing. A historical study has proved that the system of final consonants of Hunmin-chong'um correctly represented the system of phonemic contrasts in the syllable-final position (Huh 1960). It is significant to note that the principle employed by hangul scholars in their analysis of final consonants is basically similar to the principle employed by Bloomfieldian linguists in similar situations. A more detailed discussion of this aspect of Hunmin-chong'um will be attempted later in this paper.

Hunmin-chong'um had a system of 7 simple vowels and 4 compound vowel letters. hangul scholars correctly preceived the vowel as the nucleus of the syllable. Haerye says that, as Heaven, Earth, and Man are the essence of the Universe, the medial phone (vowels) is the essence of the syllable. This philosophization of the vowel is reflected in the shaping of vowel letters. First, three letters --- ㆍ/ɔ/, ㅡ/ə/, ㅣ/i/ --- which symbolize Heaven, Earth, and Man respectively, were devised. And the rest of the vowels were represented by combining these three letters.

The description and the explanation of the vowels in Haerye is perfectly correct and flawless even from the standard of modern linguistics. Haerye first describes three basic vowels in terms of the contraction of the tongue (the tongue position) and the depth of voice (the acoustic impression). It says:

ㆍ/ɔ/: the tongue is retracted and the voice is deep;
ㅡ/ə/: the tongue is less retracted and the voice is neither deep nor shallow;
ㅣ/i/: the tongue is not retracted and the voice is shallow.

The other four simple vowels are described in terms of the degree of the opening of the mouth, relative to that of the three basic vowels. The description of the vowels in Haerye can be summarized as in the following table:

acoustic impr. / tongue posit. / degree of mouth opening	shallow	neither shallow nor deep	deep
	advanced	less retracted	retracted
narrow	ㅣ /i/	ㅜ /ɯ/	ㅗ /u/
normal		ㅡ /ə/	ㆍ /ɔ/
wide		ㅓ /ʌ/	ㅏ /a/

This description of the vowel system shows that hangul scholars represented the vowels with a complete understanding of the systematic relationship among them. They correctly described the vowels in terms of the tongue position, the opening of the mouth, and the acoustical impression. The general statement in Haerye on the vowel says that the vowels are interrelated with and differentiated from each other by "the degree of depth and shallowness, and of opening and closing." The spirit underlying this statement is reminiscent of the attitude of modern structuralists who think that a linguistic unit is a bundle of distinctive features and its value is determined by opposition and interrelationship existing among units.

The compound vowels were interpreted in Haerye as simple vowels whose articulation starts from the articulatory position of the vowel /i/. Haerye explains:

ㅠ /yu/ is the same as ㅗ/u/, but starts from ㅣ /i/;
ㅑ /ya/ is the same as ㅏ/a/, but starts from ㅣ /i/;
ㅟ /yɯ/ is the same as ㅜ/ɯ/, but starts from ㅣ /i/;
ㅕ /yʌ/ is the same as ㅓ/ʌ/, but starts from ㅣ /i/.

The above explanation shows that hangul scholars perceived the complex phonetic quality of the high front glide. However, they decided to represent those phonetically complex sounds as functionally simple vowels. There is, in fact, ample evidence in Middle Korean texts showing that those phonetically complex vowels were phonemically simple vowels.

The system of Hunmin-chong'um, which has been discussed here, evidences that the hangul scholars' analysis of the phonological system of Middle Korean was basically corect, and that they represented the result of their analysis in the new system of

writing with remarkable originality. The most original achievement of hangul scholars is the **visualization** of a phonologcial system. Not only the basic letters were shaped according to the shape of the organs of speech, but the letters for sounds of homorganic series were shaped by adding diacritics to the homorganic basic letters or juxtaposing the basic letters. Thus, the writing system had graphic correlation among the sounds of hormorganic series. This graphic representation of the phonological system was unique and unprecedented in any other system of writing at the time when Hunmin-chong'um was made.

Another unique characteristics of Hunmin-chong'um as a writing system is that it provided not only a correspondence between individual letters and phonemes but, beyond that, a correspondence between characters and syllables. This aspect of Hunmin-chong'um can be examined from two different points of view, typographical and linguistic. From a typographical point of view, the non-linear combination of letters in a character complicates the typographical process. Linguistically, this graphic syllabication seems to represent more adequately the structure of utterances. Since Korean is a syllable-timed language, Koreans perceive the syllable as a distinct segment in speech utterances and pronounce it accordingly. This graphic ayllabication is another means by which the structure of the language is visualized.

There is much evidence in Haerye that hangul scholars conceived the sound system of language as an organic entity in which sound units form a harmonious and symmetrical system. In the opening pages of Haerye, it is stated that the authors were merely analyzing and representing the law of Nature inherent in human speech. Much of the space of Haerye is spent in philosophizing this belief. They classified sounds in terms of three Spheres (Heaven, Earth, and Man) and five Elements (Moon, Fire, Water, Wood, and Metal), which together combine to form the harmony of the Universe. The zero consonant marker ㅇ /Ø/ and the description of the system of vowels are manifestations of this concept of the basic structure of sound system.

Finally, the system of representation of Hunmin-chong'um has a strong similarity to what Chomsky (1964) calls the level of taxonomic phonemic representation. Bloomfield says that the only kind of written record which is scientifically relevant is "a record in terms of phonemes, ignoring all features that are not distinctive in the language" (Bloomfield 1933:85). Furthermore, taxonomic phonemicists say that, if a record is to be strictly phonemic, the conditions of bi-uniqueness and local determinacy should be strictly observed, that is, all features that are distinctive but not immediately observable in the stream of speech such as morpheme boundary, word structure, and morphemic relation should be ignored (Bloch 1958:93-96). As discussed earlier in this paper, the establishment of the system of eight consonants in the syllable-final position guaranteed the observation of the conditions of bi-uniqueness and local determinacy in the transceiption of isolated syllables. These conditions were observed also in the transcription of connected

utterances by faithfully representing even those morphphonemic alternants, the occurrence of which could be predicted consistently in terms of immediate phonological environment:[6] e.g., hap.nida 'I do' in modern orthography was ham.nida in Hunmin-chong'um. In short, the 15th century Korean orthography closely approximates the phonemic transcription conceived and practiced by modern taxonomic phonemicists, and it almost achieves the orthographical goal of "one letter per phoneme" which has been proposed by many modern linguists.

However, the orthographical ideal of perfect correspondence between letters and phonemes has been questioned by some linguists in recent years. Departure to some extent from phonetic consistency and compromise spelling in a practical orthography were advocated by Daniel Jones. He says that each word should be written in only one way, ignoring morphophonemic alternations such as assimilation, elision, or coalescence. To alter the spelling in order to conform to changes of pronunciation in connected speech would merely render the written word less easily recognizable... Reading would in fact be hampered by the use of such variant spellings (Jones 1957). Jones is here arguing that morphophonemic relations should be incorporated into a practical orthography on the ground that it would give a word a definite and easily recognizable visual form.

Besides this rather practical psychological advantage, the incorporation of morphophonemics into the system of a written record has deeper linguistic significance. This significance is clearly stated by Bloch in his paper on Japanese:

> A normalized notation, still firmly based on the phonemic analysis but incorporating the most common or the most important morphophonemic relation --- especially those that are automatic --- and such grammatical features as word boundary and pitch morphemes ... is usually far better adapted to the discussion of morphpology and syntax than a wholly unmodified transcription; when used for the writing of connected text it reveals more of linguistic structure; and those who already know the language find it easier to read. (Bloch 1958:348)

This system of representation, which incorporates structural information on the syntactic level, is given a full status as the level of systematic representation of language by Chomsky (1964). He argues that the level of systematic phonemics in which the choice of elements is deeply determined by properties of both the syntactic and the phonological components is the only level of representation in the phonological component which provides the simplest and the most generalized account of linguistic structure.

If a system of written record which meets all the requirements of practical orthography and also adequately represents linguistic structure is an ideal orthography, the 15th century Korean orthography, which gives no consideration to the complex morphophonemic system of the Korean language, is far from being an

ideal one. It was not without reason that Korean linguists of the early 20th century were interested in the systematic representation of these morphophonemic relations in their orthograpy. After years of study and preparation, Hangul-hakhoe ('the institute of the Korean language') established modern Korean orthography upon its publication in 1933 of A guide for the unification of Korean spelling. Although it is maintained that the spirit of Hunmin-chong'um was faithfully followed, modern Korean orthography marks a substantial departure from the 15th century orthography. The most important modification is the use of all the letters of initial consonants in representing final consonants,[7] instead of eight as in Hunmin-chong'um. The resultant modification made in the reformed system of writing is the fixed representation of morphophonemic alternations which can be consistently predicted phonologically (automatic alternations[8]). A comparative discussion of a characteristic representation of the modern orthography with the corresponding representation of the 15th century orthography will show more clearly the characteristic features of Hunmin-chong'um as a writing system.

In modern Korean orthography, morphophonemic alternations such as assimilation, palatalization, and metathesia are ignored by representing only the base forms of alternants, as in:

	modern spelling	gloss	pronunciation	15th c. spelling
a.	han.mom	'one body'	[hammom]	ham.mom
b.	anh.ta	'be not'	[ant'a]	an.t'a
c.	kat'.i	'together'	[kac'i]	ka.c'i
d.	anc.ta	'to sit'	[ant"a]	an.ta

The example in row (a) shows the fixed representation of morphophohemic alternants caused by assimilation; in row (b), metathesis; and in row (c), palatalization. The example in row (d), although somewhat different, can also be explained phonologically. The phonemic pattern of modern Korean permits no three-consonant cluster within a syllable. Therefore, the phoneme /c/ /nc.t/ is dropped when not followed by a vowel to become the initial consonant of the following syllable.

The base form represented in the orthography is the morphophonemic alternant which appears in those environments in which the phonemic pattern of the language does not force the choice. This incorporation of morphophonemic relations into the modern orthography provides an easily recognizable visual form of a word (or a morpheme) which could otherwise be given a multiple representation as in the 15th century orthography. More significantly, the modern orthography systematically represents the morphological structure of the language. This aspect can be more clearly observed in the following example:

modern spelling	gloss	pronunciation	15th c. spelling
tac'	'anchor'	[tat]	tat
tac'.i	'anchor'+Nom.	[tac'i]	ta.c'i

This example shows that the representation of the morphological structure is achieved by the fixed representation of the base form of the stem and the nominative case marker. This fixed representation clearly visualizes the stem-affix relationship, and it undoubtedly serves to simplify the description of the morphological structure of the language. This systematized represenation of morphological structure is totally lacking in the 15th century Korean orthography.

The base form of the example above requires a further discussion. In modern Korean as in Middel Korean, the phonemic distinction among the members of homorganic stops and affricates is neutralized in the syllabel-final position. /p, p', p"/ are neutralized to /p/; /t, t', t"/ are neutralized to /t/; /k, k', k"/ are neutralized to /k/; and /c, c', c"; s, s"/ are neutralized to /t/. Since this neutralization occurs only in the syllable-final position, and the distinction is restored when followed by a vowel, the morphophonemics of this type can also be consistently predicted. Accordingly, modern Korean writing system orthographically represents the basic distinction even when actual pronunciation does not show it. For example, /t/ in the syllable-final position is represented by eight symbols: /t, t', t", c, c', c", s, s"/. This multiple representation of a single phone marks a departure in modern Korean orthography from the orthographical ideal of "one letter per phoneme."

Viewed from the principle of taxonomic phonemics, a multiple representation of a single phoneme cited above is a serious violation of the conditions of bi-uniqueness and local determinacy. The violation of linearity condition is also involved as we saw in the example in row (b) cited above. At this point, it is not difficult to see that the representation of modern Korean orthography corresponds to that of systematic phonemics advocated by Chomsky, whereas the 15th century orthography is basically the phonemic transcription of taxonomic phonemics.

It is interesting to see that the 15th century and modern Korean orthgraphies, which were both established before the advent of modern linguistic theories, basically correspond to the system of linguistic representation proposed by Bloomfieldian and Chomskian linnguistics respectively. This is very suggestive of the fact that the basic concepts of modern linguistic theories can be found in the linguistic thoughts of the pre-scientific era in Korea.

That no consideration was given to morphological structure of the langauge discredits neither the achievement of hangul scholars nor the excellence of Hunmin-chong'um as a system of writing. The exclusion of grammatical considerations from the new system of writing was a deliberate one, done to make the system an easy one for the common people to learn. Haerye's explanation of final consonants shows hangul scholars' awareness of those morphophonemic relations, and the system of writing used in Yongbi-ochon-ga ('the song of flying dragons') is partially morphemic very much like modern Korean orthography.

The evaluaton of Hunmin-chong'um, therefore, should be done in terms of the phonemic principles on which the making of the system was based. Even though it has a few minor weaknesses, Hunmin-chong'um is one of the most perfect phonemic systems of writing ever devised and is a product of the most penetrating analysis of language in the pre-scientific era. Considering the cultural environment in which the system was created and the correctness of the underlying phonological analysis, the achievement of hangul scholars and the excellence of Hunmin-chong'um as a system of writing deserve the highest admiration.

NOTES

[1]The discussion of hangul in this paper is based on the information in Haerye.

[2]song literally means 'voice'. It corresponds to 'phoneme' in a modern term. song will be labelled hereafter in this paper in one of the following three ways: phone, vowel, consonant, depending upon the context.

[3]The typographical combination of these letters into a character is governed by simple rules according to the shape of the letters. The medial letter is written either to the right of or under the initial letter, and the final letter is put under the medial letter, e.g., 각 /kak/, 곡 /kok/.

[4]This chart is based mainly on the explanation in Haerye. References are also made to Huh (1960). The zero consonant marker /ø/ has been omitted from this chart.

[5]The 'lingual' and the 'dental' sounds are alveolars and sibilants respectively in modern terms. They are so termed because the tip of the tongue touches the alveolar ridge in the production of the alveolar sounds and the side of the tongue touches the teeth in the production of the sibilants. This terminology was borrowed from Chinese phonology.

[6]This aspect of hangul is not explicitly explained in Haerye. Evidence for this statement is found in the books written in hangul during the preparation period for its promulgation.

[7]By final consonants is menat here those of orthographical syllables. Final consonants of orthographical syllables in modern orthography are very often initial consonants of immediately following syllables in connected speech.

[8]As defined by Wells (1949)

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AN EXPLANATION OF SYLLABLE STRUCTURE CHANGE IN KOREAN
With Special Reference to Vennemann's Preference Laws*

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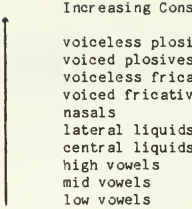
This paper deals with various aspects of syllable-related phenomena in Korean with reference to the framework given in T. Vennemann (1985). Korean data are scrutinized in terms of his eight `universal' Preference Laws in order to determine the extent of the universality of his Laws (with some exceptions). This language-specific study is a test case for the theory of universal phonology to the extent that it explains the changes of syllable structures in the history of the Korean language.

The first part of this research deals with various aspects of syllable-related phenomena in the history of the Korean language. One may apply to these data any of the syllabic principles recently suggested as universal such as the Principle of Maximal Onset by Selkirk (1982) and others, the principle of autosegmental syllabification by Steriade (1982), and `CV-phonology' by Clements and Keyser (1983), among others.

Here, however, the theoretical framework recently given by Vennemann (1985) will be exclusively adopted to examine how these `universal' laws contribute to a more natural explanation of Korean data, and to discuss some empirical implications of the data for and against the theory. Vennemann (1985) synthesizes many works previously published beginning his pioneering study 1972 through 1974, 1978, 1982, 1983 and Murray and Vennemann (1983). The present paper will therefore refer to that synthesis only, because his 1985 work contains the most complete framework to be used as a universal basis.

For convenience, the essential parts from Vennemann (1985) will be quoted at first; viz. the scale of Unviversal Consonantal Strength and some preference laws for syllable structure.

(1)



The list of laws and their details are as follows.

(2) A. Preference laws for individual syllables

1. The Head Law
2. The Coda Law
3. The Nucleus Law

B. Preference laws for sequences of syllables

4. The Weight law
5. The Law of Initials
6. The Law of Finals
7. The Strength Assimilation Law
8. The Contact Law

(3) The Head Law: A syllable head is more preferred, (a) the closer the number of speech sounds in the head is to one, (b) the greater is the Consonantal Strength value of its onset, and (c) the more sharply the Consonantal Strength drops from the onset toward the Consonantal Strength of the following syllable nucleus.

(4) The Coda Law: A syllable coda is more preferred, (a) the smaller is the number of speech sounds in the coda, (b) the lesser is the Consonantal Strength of its offset, and (c) the more sharply the Consonantal Strength drops from the offset toward the Consonantal Strength of the preceding syllable nucleus.

(5) The Nucleus Law: A nucleus is more preferred, (a) the steadier its speech sound, and (b) the lesser the Consonantal Strength of its speech sound.

(6) The Weight Law: In stress accent languages an accented syllable is more preferred the closer its syllable weight is to two moras, and an unaccented syllable is more preferred the closer its weight is to one mora. (The optimal stressed syllable is bimoric, the optimal unstressed syllable is unimoric.)

(7) The Law of Initials: Word-medial syllable heads are more preferred

the less they differ from possible word-initial syllable heads of the language system.

(8) The Law of Finals: Word-medial syllable codas are more preferred the less they differ from possible word-final syllable codas of the language system.

(9) The Strength Assimilation Law: If Consonantal Strength is assimilated in a syllable contact, the Consonantal Strength of the stronger speech sound decreases.

(10) The Contact Law: A syllable contact A$B is more preferred the lesser the Consonantal Strength of the offset A and the greater the Consonantal Strength of the onset B --- more precisely: the greater the characteristic difference CS(B)-CS(A) between the Consonantal Strength of B and that of A.

It seems to me possible to state additionally that (2A) must be overridden by (2B), when they apply sequentially in a framework admitting relative ordering. This overriding relationship is intuitively quite necessary, because one has to deal eventually with sequences of syllables after handling individual syllables. After all, language consists of linear sequences of syllables.

Vennemann (in personal communication) laid down a set of principles by which the laws operates in case of conflict. Since we are talking about `laws' which will inevitably be violated, it is more likely that ordering is necessary. On the other hand, rules cannot be violated at will. Note that Vennemann (1974) advocated the No-Ordering Principle of `Rules': Rules of grammar cannot be extrinsically ordered.

Note also that Vennemann (1985) already envisaged a conflict between (9) and (10) in his conclusion and wisely mentioned that "improvement on one parameter can entail deterioration on another. It is impossible to optimize a language system on all parameters at once; there cannot exist an `optimal' language system as such but only systems that are optimized on some parameters. The same holds true even within the narrow limits of syllable structure."

However, the actual cases in which we have to take care of relative priority in applying some of (2A) and some of (2B), sequentially, are rather limited to a certain permutation: e.g. Apply (2A 1, 2, 3) to a syllable X and also (2A 1, 2, 3) to a syllable Y, and then apply either (2B 7) or (2B 8) to "the sequence of the coda of syllable X and the head of syllable Y, i.e. the coda by (2A 2) and the head by (2A 1)." between (2B 7) and (2B 8), namely (9) and (10) must precede (9). See (16) for more details.

Although the contents of (2B 5) and (2B 6) presuppose (2A 1) and (2A 2), there would be no ordering problem between (2B 5) and (2B 1), and between (2A 6) and (2A 2). It is enough that one must define (2B 5) and (2B 6) without relying on (2A 1) and (2A 2), as in (7, 8) and (3, 4) in order to make them independent of each other.

Here is a case in Korean data matching part (a) of the Head Law, c.f. (3). In this case, "initial consonant P plus vowel plus other consonant in the twelfth century changed into "P-initial consonant clusters" after losing a vowel by the fifteenth century: p V t -> pt, p V sk -> psk, etc. The resulting syllable heads were in Middle Korean (from 11th century to 16th) reduced to single (glottalized) tense sound by the end of the seventeenth century: pt -> tt, psk -> kk, etc. Although digraphs such as tt and kk are used here, they represent a `single' tense sounds. The following examples are cited from K.-M. Lee (1972).

(11)	12c.	15c.	17c.			
p V t	pt	tt	pt‡t	-> tt‡t	`meaning'
			ptəy	-> tte	`a raft'
			ptʌy	-> ttɛ	`dirt'
			pt‡-	-> tt‡-	`to float, to open'
			ptuy-	-> ttŭ-	`to run'
			ptəna-	-> ttəna-	`to leave'
p V s	ps	ss	psʌr	-> ssar	`rice'
			psi	-> ssi	`seed'
			ps‡-	-> ss‡-	`to be bitter, to use'
			psuk	-> ssuk	`mugwort'
			ps‡r-	-> ss‡r-	`to wipe'
p V c	pc	cc	pcak	-> ccak	`one of a pair'
			pcʌ-	-> cca-	`to weave, to be salty'
			pcok	-> ccok	`a piece'
p V sk	psk	kk	psk‡r	-> kk‡r	`a chisel'
			pskur	-> kkur	`honey'
			pskəy-	-> kkwe-	`to pierce'
			pskuy-	-> kkŭ	`to lend'
			pskay-	-> kkɛ-	`to break'
			pskay	-> kkɛ	`sesame'
p V st	pst	tt	pstay	-> ttɛ	`time'
also		cc	psti-	-> cci-	`to overflow'
			pstir‡-	-> ccir‡-	`to prick'
		th	pstati-	-> thəci-	`to be torn'
			pstoyo-	-> thŏki-	`to snap'
cf.p V th pth		th	pthʌ-	-> tha-	`to play on'
(th stands for aspirated t)			pthuy-	-> thŭ-	`to spring'
			pthuk	-> thuk	`with a snap'

As we have seen above, there is a tendency for the number of word-initial consonants to change to one. As for p V st, this may be palatalized into cc or analogized into th after changing into pst. In any case, cc and th are single sounds, too.

Although it is not an example of sound change, there is another interesting case related to part (a) of the Head Law. That is, the inventory of the Korean alphabet provides a dummy symbol `o' for the head position of `naked' syllables (namely, syllables with empty heads), e.g. ərini 어린이 `children', ociñə 오징어 `a squid'. This symbol is certainly more than null.

In addition, some occurrences of `o' may indeed be as having a sound value [ɦ], namely, voiced [h]. This [ɦ] is nothing but an alternative form of [k], e.g. ka-ko -> ka-ɦo `go and' & ar-ko -> ar-ɦo `know and' (ko changes into ho between y, r, z and a vowel). The fact that a dummy symbol and a consonant [h] share the same `o' might be additional evidence that a syllable head with one consonant is preferred to null.

As the third case matching (3a), here is an example from MK in the sixteenth century. As a strengthening process of onset speech sounds, the epenthesis of the glide y in intervocalic position became popular, e.g. hʌ + ə -> hʌyə `do and so', yəhiy + ə -> yəhiyy `lose and so'.

On the other hand, just like the Pali example syandana -> sandana in Murray (1932), Korean also developed y-deletion rule for head clusters reducing them to one consonant since the nineteenth century, e.g. syəm -> səm `island', syo -> so `cow'; kyesita -> kesita `be (honorific)', hyesəñ -> hesəñ `comet'.

However, there are some other rules in Korean against (3a) that delete the consonant in the head completely rather than reduce it to one. They are the deletion of r, z, ə, h, and ɦ in different periods of Korean history, cf. S.-O Lee (1977): rule 18, 20, 25, 34, 35, 36 --- these rule numbers are the same as the ones given in the 1977 paper. The list of rules are here attached as an appendix to avoid the repetition of the same rules in other sections. --- Nevertheless, these rules are minor rules that affect only a small number of data in most cases. Exactly speaking, to those examples of word-medial syllable heads in sequences of syllables, the Law of Initials (7) applies, e.g. rules 20, 25, 34, 35, 36.

According to (3b), the greater is the Consonantal Strength value of its onset, it is more preferred as a syllable head. This law can be related to the fact that in Korean the weakest Consonant on its Strength scale, i.e. the liquid, never occurs in the syllable-initial position. In addition, (3b) relates to the fact that there are many more entry-words starting with plosives than affricates or fricatives in a Korean dictionary. In other words, more Korean words start with consonants with greater strength.

It is also the case that weak, unaspirated and unreleased plosives never occur in onsets of words but only in syllable-final positions as defined in (4), the Coda Law. It means that [pˀ, tˀ, kˀ] are not strong enough in Consonantal Strength to be onsets, in Korean as well as in other languages.

Note at the same time that there are cases against (3b) in Korean, cf. S.-O. Lee (1977): rules 7, 9, 10, 11, 14, 15, 41. These rules make Consonantal Strength value of the onset smaller. At the moment it is

rather difficult to explain why these rules do not follow (3b), but we will make a general conclusion at the end of this paper. Exactly speaking again, the Law of Initials (7) applies to those examples of word-medial syllable heads: rules 7, 9, 10, 11, 15, 41 (but not to 14). But there are other rules, 6, 26, 30, which increase Strength and comply with (3b).

It is difficult to find a good example in Korean to support or to refute (3c), because Korean has always had only a very limited set of initial consonant clusters as already shown in (11).

The Law (4a) is nicely supported by the fact that eleven consonant clusters in coda of the Present-day Korean(ks, nc, nh, rk, rm, rp, rs, rth, rph, rh, and ps) are simplified by dropping one member of each cluster. For instance, when a nasal and a liquid abut in the coda, a nasal is preferred to a liquid in the simplification of consonant clusters and likewise a liquid to a plosive and also a plosive to a fricative: nasal -> liquid -> plosive -> fricative. Note, however, that Vennemann's scale of Consonantal Strength is in the different order from the Korean case, namely, a liquid is preferred to a nasal, etc.: "liquid -> nasal -> fricative -> plosive". Yet the number of sounds in the coda is reduced any way.

Besides the case mentioned above, there are other cases where final consonants (mostly r) are completely deleted. Cf. S.-O. Lee (1977): rules 16, 21, 27, 33. These rules also support (4a). On the contrary, there is only a rare case in which the epenthetic n is inserted in the coda to avoid a hiatus: rule 24. The rules 22 and 24 are for sequences and need to refer to the Law of Finals (8).

There are some rules which support (4b), but also a few rules which refute (4b) in Korean. The former include rules 8, 12, 15, 17, while the latter include rules 1, 3, 5 in S.-O. Lee (1977). Rules 3, 5, 15, 17 are related to sequences which should be reconsidered with reference to Law (8).

Nevertheless, part (b) of Coda Law is evidently realized in Modern Korean in the neutralization of the final plosives into their weak, unaspirated, and unreleased correlates in syllable-final position.

(12) nap [nap˺] `lead'
nat [nat˺] `grain(s)'
nak [nak˺] `pleasure'

Interestingly, however, [t˺] in (12) represents neutralization of not only t but also s and z into [t˺] that took place in syllable final position by the middle of the sixteenth century. This change (s or z to [t˺]) is against the preference for the lesser Consonant Strength in the offset. On the other hand, c was formerly neutralized into [s˺] by the fifteenth century, and this change (c to [s˺]) is in conformity with the preference law (4b).

In addition, there is the phenomenon that r is realized as [l] in the syllable/word-final position. One may consider that this final [l] is the unreleased version of r, but l is not weaker at all than r in the scale of Consonantal Strength. It means this change (r to [l]) might be a

counterexample to Coda Law (b). However, one can regard this change merely as a part of overall neutralization in the Korean final consonants.

To sum up, here is the list of the syllable-final consonants in three different stages in the history of Korean:

(13) Modern Korean		12c	15c	17c.(-20c.)
		[m]	[m]	[m]
		[n]	[n]	[n]
		[n]	[n]	[n]
nar [nal] `a day'	r ->	[l]	[l]	[l]
iph [ipʾ] `a leaf'	(ph ->)	[pʾ]	[pʾ]	[pʾ]
nah- [natʾ] `to breed'		[h]		
nath [natʾ] `a piece'	(th ->)	[tʾ]	[tʾ]	[tʾ]
(k z [kazʾ] `edge'		[zʾ]	[zʾ]	
nath [natʾ] `a sickle'		[sʾ]	[sʾ]	
nach [natʾ] `a face'	(ch ->)	[cʾ]		
nac [natʾ] `daytime'				
-ny kh [nyəkʾ] `the area of'	(kh ->)	[kʾ]	[kʾ]	[kʾ]

One can observe that the number of final consonants is diminished by a sequence of merging neutralizations as indicated by arrows. It means probably that, although the unreleased final consonants are preferred in the coda, the number of those consonants can be reduced depending on the other forces in the structure of sound system.

The apparent rarity of examples of (4c) --- even Vennemann (1985:320) presents only a single example from Sanskrit --- may explain why it is not easy to find a suitable example of this part of Coda Law in Korean.

Part (a) of the Nucleus law (5) expresses the idea that "monophthongs are preferred to diphthongs". Monophthongization of diphthongs in Korean occurred first at the end of the eighteenth century: (ay ->) ay -> ɛ , əy -> e. The second monophthongization was introduced in the twentieth century: oy -> ø, uy -> ü. But these front rounded monophthongs are already disappearing now.

Part (b) of the Nucleus Law implies that "most languages tolerate only vowels as nuclei." Korean is one of these languages.

As for the Weight Law, one may relate this law only to stress-accented languages. However, it seems to me that one may also express an analogous statement in relation to `length': The optimal long syllable is bimoric; the optimal short syllable is unimoric. With this extended law, Korean can safely serve as supporting evidence.

The Law of Initials is generally applicable to Korean data, but there is a contrary case to this law. That is, Korean deletes word-initial r and n before i or y, and changes word-initial r before other sounds (than i or y) into n. As a result of this language-specific initial law in Korean, the number of possible word-initial syllable heads is diminished, while

the number of word-medial syllable heads has not been increased. As a result there is more variety in word-medial syllable heads than in word-initial syllable heads in Korean.

The Law of Finals is likely to be quite compatible with Korean data. However, only similar (not the same) kind of data can be found in the Present-day Korean. Vennemann (1985:328-329) presented the Sanskrit case in which final consonants are doubled before other consonants. Compare the Sanskrit forms such as sap.ta- -> sap.pta- `seven', ak.tubhih -> ak.ktubhih `at night', ar.kah -> ark.kah `sun', ar.ta -> art.ta `concerned with relevant Korean examples which will be presented in (17) to illustrate the similarity to other cases of the Contact Law.

As for Strength Assimilation Law, there are two examples in Present-day Korean favorable to this Law. First, nasal lateralization can be presented. Note that the lateral with lesser Consonantal Strength dominates the nasal with greater Consonantal Strength. In (14), /r/ is represented as [l] to show phonetic representation. Note that both of the patterns presented in Vennemann (1985: 331, l.n -> l.l, r.n -> r.r; 333, n.l -> l.l, n.r -> r.r) are evident:

(14) a. progressive nasal lateralization (l.n -> l.l)
chal.na -> chal.la `a moment'
khal.nal -> khal.lal `the blade of a knife'
il.ny n -> il.ly n `a year'

b. regressive nasal lateralization (n.l -> l.l)
man.li -> mal.li `ten thousand li, ca. 2,500 miles'
sin.la -> sil.la `one of the Three Kingdomes'
cən.la -> cəl.la `the province of Chonla'

There is another favorable case to this law, viz. regressive nasal assimilation. Note here that the nasal with lesser Consonantal Strength dominates the plosive with greater Consonantal Strength.

(15) a. p.m -> m.m
pap.məkta -> pam.məkta `to eat food'

b. p.n -> m.n
cap.n̩n -> -> cam.n̩n `holding'

c. t.m -> n.m
mat.myən̩ri -> man.myən̩ri `the wife of one's eldest son'

d. t.n -> n.n
pat.n̩n -> pan.n̩n `receiving'

e. k.m -> ñ.m
kuk.mur -> kuñ.mur `soup'

f. k.n -> n.n
mək.n+n -> məñ.n+n `eating'

So far, in either progressive or regressive assimilation, the speech sound with lesser Consonantal Strength dominates. However, the opposite is observed in the so-called `lateral nasalization' in the Present-day Korean. In other words, the sound with greater Consonantal Streagth, i.e. nasal, dominates. In (16), however, r -> n is a strengthening by Contact Law and p -> m is an assimilation. Thus, these changes are related to Contact Law rather than Strength Assimilation Law. This is interesting for the same data in (16) may be applied to two Laws, namely (9) and (10). However, if (9) is applied, (16) will be an exception to (9). Therefore, (10) should be applied to interpret (16) without treating it as an exception. This is a case that the relative ordering between (9) and (10) is required and (10) must precede (9) based on the data (16).[2]

(16) a. p.r -> p.n -> m.n
sip.ryuk -> sip.nyuk -> sim.nyuk `sixteen'

b. t.r -> t.n -> n.n
pic.ryaň -> pit.ryaň -> pit.nyaň -> pin.nyaň `debt'

c. k.r -> k.n -> n.n
pɛk.ro -> pɛk.no -> pɛň.no `white dew, white heron'

d. m.r -> m.n
kam.ro -> kam.no `sweet dew'

e. ň.r -> ň.n
koň.ro -> koň.no `merits'

There is an equal number of pros and cons to this Strength assimilation Law according to a check of the list of rules in S.-O. Lee (1977). Pros: rules(9, 11, 13, 26); cons: rules (1, 2, 3, 5). In this case, it is rather difficult to decide in favor of one or the other.

As for (10), Contact Law, Korean has a kind of fortition (A.B -> A.BB), which is different from the gemination suggested by Vennemann (A.B -> A.AB). The following Korean data are quoted from U. Ho (1965).

(17) a. p.p -> p.pp ap.pak -> ap.ppak `pressure'
t.p -> t.pp nat.pota -> nat.ppota `to despise'
k.p -> k.pp kak.pyər -> kak.ppyər `special'

b. p.t -> p.tt kup.tori -> kip.ttori `the base molding of a wall'
t.t -> t.tt kas.turumaki -> kat.turumaki -> kat.tturumaki `old-fashioned hat and coat'
k.t -> k.tt nak.tam -> nak.ttam `discouragement'

c. p.s -> p.ss nap.se -> nap.sse `tax payment'
t.s -> t.ss nas.sar -> nat.sar -> nat.ssar `age'
k.s -> k.ss nak.səň -> nak.ssəň -> `completion of a building'

d. p.c -> p.cc nap.cakkho -> nap.ccakkho `a flat nose'
t.c -> t.cc kas.cañi -> kat.ccañi `a man wearing a hat, a hat maker'
k.c -> k.cc nak.ci -> nak.cci `a small octopus'

e. p.k -> p.kk nap.k mi -> nap.kk mi `a kind of spider'
t.k -> t.kk tot.kuta -> tot.kkuta `to make higher'
k.k -> k.kk tok.kam -> tok.kkam `flu'

There is also a different kind of contact epenthesis from the one suggested by Vennemann (A.B -> A.CB). The first case is y-insertion between vowels to avoid a hiatus in the sixteenth century: hʌ.a -> hʌya. The second case is n-insertion in two different environments: mur.yak -> mur.n.yak -> mur.ryak [mulljak] `liquid medicine'.

So far, we have seen that the Korean data are mostly compatible with the Vennemann's Preference Laws and other framework, although there were some cases only similar but not the same as he demonstrated and even some seemingly apparent counterexamples. However, to solve these seemingly exceptional cases, the conclusion in Vennemann (1985) can be appealed. He concluded that "when syllable structure is altered without any resulting syllable structure improvement, or even with a deterioration of syllable structure, the change is not syllable structure change in the technical sense but change motivated by some other factor and only incidentally affects syllable structure." Therefore, we must find the reason why a certain case does not comply with the Preference Laws, whenever an apparent exception is encountered. In this paper, some of the exceptions are still unexplained and I hope these will be resolved in the near future.

It is interesting to note that Vennemann's framework is focused on the environment of phonological rules especially in terms of the positions in a syllable or a sequence of syllables. On the other hand, the framework by C.-W. Kim (1972, 1973), i.e. conspiracy in phonology, is focused on the changing part (A -> B) of the rules rather than the environment of rules (/__$), cf. A -> B /__ $.

In any case, as already mentioned in S. O. Lee (1977) , it is very crucial to consider the relative importance and frequency of rules at issue, in other words, a sort of `functional load' of each rule in the language. Almost a decade ago, I suggested that it would be desirable to pursue the study of `functional load' of rules as well as phonemes, but I myself have not been able to take care of this problem simply because of indolence. Through a systematic method, this task must be challenged soon.

APPENDIX

The numbers of the rules are the same as the ones given in S. O. Lee (1977).

(1) 15c. β -> p / __ C e.g toβa- -> topko `help and'

(2) 15c. /β/ -> p / {h, k, t}
kisk + /β/i- -> kisk + pɨ- -> kispɨ- `be happy'
mit + /β/i- -> mit + pɨ- `be reliable'

(3) 15c. h -> t / __ + n
nyəh + nʌn -> nyət.nʌn (-> nyənnʌn) `put into'

Some irrelevant rules are not listed here.

(5) 16c. s -> t / __ {C, #}
is + nʌni -> itnʌni (-> innʌni) `tie, so'

(6) 17c. x -> kh / # __
xyə -> khyə `pull'

(7) Old K. t -> r / V__V
*patər -> parər `sea'

(8) 12c. t -> r / __#
*kat -> kar `thirst(y)'

(9) 14c. b -> /β/ / {y, r} __ V
taybat -> tayβat `bamboo field'

(10) 15c. /β/ -> w / {V, y, r, z} -- V
syəβir -> səwur -> səur `capital city'
* koba -> ko a -> kowa `be pretty and'

(11) 15c. k -> h / {y, r, z} -- V
* mulkai -> *[mulgai] -> [molɦay] `sand'
ar + ko -> ar + ɦo `know and'

(12) 15c. c -> s / __ #
koc -> [kosˀ] `flower'

(13) 16c. h -> l / l __
[ol] + [ɦa] -> [olla] `mount and'

(14) 17c. {t, th} -> {c, ch} / __ {i, y}
tisay -> cisay `tile'

(15) 18c. l-> r / V __ V
nolhay -> nolay -> noray `sing'

(16) Pres. K. c -> ø / r __ {C, #}
kors -> kor + kwa [kolgwa] `direction and'

(17) Pres. K. {c, ch, th} -> s /__ #
cəc + ɨr -> [cəsɨl] `milk'(acc.)
path + ɨr -> [pasɨl] `field'(acc.)

(18) Old K. r -> ø / # __ {i, y}
<till Pres. Korean>
ryansim -> yansim `conscience'

(20) Mid K. r -> ø / V __ V
*narih -> nayh `stream'

(21) Mid K. r -> ø / __ #
*hyer -> hyə `tongue'

(22) 15c. r -> ø / __ [+cor] *kyez̟rsari -> kyɘz̟sari `mistletoe'

(24) 16c. / -> n / V __ V syo-aci -> syoñaci `calf'

(25) 16c. z -> ø / { __ {i, y} ; V __ V } sʌzi -> sʌi `between'

(26) 16c. z -> c / {m, n} __ V * namzin -> namcin `man'
(monso ->) momzo -> momco `in person'

(27) 17c. r -> ø / __ph arph -> aph `front'

(30) 18c. c -> k / __ {i, y} timchʌy -> cimchʌy -> kimchʌy
`pickled cabbage'

(32) 19c. y -> ø / { { {s, c, ch} __ ; __ e } } syɘm -> sɘm `island'
syo -> so `cow'
kyesita -> kesita `be'(honor.)
hyesəñ -> hesəñ `comet'

(33) Old K. * ɣ -> ø / __ {C, #} * namɔɣ ->namo `tree' ([namg]
before vowel-initial suffix)

(34) 15c. β -> ø / V [+back] __ i suβi -> sui `easily'
saβi -> sai `shrimp'

(35) 15c. h -> ø / {z __ V ; l __ V} kʌzhay -> kʌzay `scissors'
18c. = (15)

(36) 15c. h -> ø / V __ V maktahi -> maktay `stick'

(37) 16c. ø -> y / V __ V hʌ + a -> hʌya `do and so'

(38) 18c. {k, kh} -> {c, ch} / # __ {i, y} kir̟m -> cir̟m `oil'
khi -> chi `winnow'

NOTES

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[1]Perhaps deletion is so different from reduction in nature that it is not fair to apply (3a) to the case of deletion from the very beginning.

[2]Robert Murray (in personal communication) suggests that this `ordering' between (9) and (10) is language specific. He does not think we will ever be able to predict which syllable structure improvement will take

place but only certain characteristics of it, e.g. its generalization pattern.

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NEGATION IN KOREAN AND PRAGMATIC AMBIGUITY

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There have been numerous syntactic and semantic analyses of the two types of negative declarative sentences in Korean. This paper is concerned with two recent attempts to differentiate between the two types of negation in terms of (1) the Aristotelian semantic opposition of "contrary" vs. "contradictory" and (2) pragmatic ambiguity. It is suggested that, especially among younger speakers, Short NEG may be the unmarked form with Long NEG being used when either the conversational situation or the subject calls for a less casual form.

In Korean there are two types of negative declarative sentences, one in which the negative morpheme an(i) is placed before the verb and another in which the verb is nominalized using ci, followed by the negative morpheme an(i) and the verb hata `to do.' These two types of negation will be referred to as Short NEG and Long NEG respectively in this paper (cf. Choi 1985). A number of proposals have been made to differentiate between these two negative forms in terms of underlying structure and, more recently, in terms of the scope of negation.

In this paper I am concerned with two recent and related proposals regarding negation in Korean and pragmatic ambiguity. Horn (1985) suggests that the two types of negation can be differentiated in that Short NEG is unambiguously descriptive and Long NEG is interpretable either descriptively or metalinguistically. Horn claims that negation is ambiguous pragmatically, not semantically, and distinguishes between ordinary truth functional negation which negates a proposition, and metalinguistic negation which negates not only the propositional content of an assertion but also presupposed and implicational material connected with the assertion. In making his suggestion about Korean, Horn cites data presented by Choi (1983), later published as Choi (1985).

I will first argue that Choi's (1985) claim that the two types of negation in Korean can best be differentiated by employing the Aristotelian distinction of "contrary" vs. "contradictory" opposition is not well supported due to a significant omission in his analysis of scalar predicates in Korean. Second, I will argue that Horn's suggestion that

Short NEG is unambiguously descriptive cannot be supported in view of data which indicate that Short NEG is used in a metalinguistic sense in some cases. Finally, I will suggest two possibilities of pragmatic influence on the choice between Short and Long NEG.

Before dealing with these three specific issues, I will briefly outline the basic facts of Korean negation. Cho (1975) notes that for most native and non-native Korean grammarians, a sentence may be negated in two ways. The following examples taken from Cho illustrate this view. For the affirmative sentence in (1), both (2) and (3) are possible negatives.

(1) Mary-ka ca - ess ta.
SM sleep-past DE
`Mary slept.'

(2) Mary-ka an ca-ess ta.
not
`Mary did not sleep.'

(3) Mary-ka ca-ci an ha-ess ta.
NMZ do
`Mary did not sleep.'

(Following Cho's abbreviation system, in the above examples SM = subject marker, DE = declarative sentence ending, NMZ = nominalizer.)

Cho analyzes the two types of negation as differing in scope, with the Short NEG type shown in (2), which he terms preverbal negation, exhibiting narrow scope over just the verb, and the Long NEG type shown in (3), termed postverbal negation, as having either narrow scope over just the verb or wide scope over delimiters. Based on this analysis, he concludes that Short NEG is always unambiguous since it can have only narrow scope, while Long NEG is potentially ambiguous due to its possible wide-scope reading. Short NEG and Long NEG sentences are seen as synonymous when the Long NEG negation is a narrow scope (verb) negation.

Kuno (1980) also analyzes the scope distinction as being one of verbal negation vs. sentence negation; (2) being an instance of verbal negation and (3) an instance of sentence negation.

Song (1973, 1979, 1982) claims that the two types of negation in (2) and (3) are not both instances of the negation of a single affirmative sentence as shown in (1), but rather that only (2) is the negative counterpart of (1) and that (3) is related to a different underlying affirmative sentence. According to Song's analysis, (4) is the affirmative sentence corresponding to (3).

(4) Mary-ka ca - ki lul ha-ess ta.
SM sleep NMZ OM do-past DE
`Mary slept.'

Song (1982) presents convincing data which seem to refute the claims made by Cho and Kuno that Short NEG is unambiguously verbal negation whereas Long NEG may be either verbal or sentence negation. An example

from Song of negation using Short NEG is presented in (5). As he points out, this sentence does seem to have to be interpreted as sentence negation since the expected verb negation is semantically incongruous. Only the sentence negation reading is possible and this should not be the case if Short NEG is restricted to verbal negation.

(5) pi ka manhi ani wassta.
rain a lot NEG came
`It didn't rain a lot.'

I will not go into further details of these claims, but simply mention them here to give an overview of the basic facts of Korean negation and recent claims made concerning the scope of what is negated by the two types of negation. (Choi 1985 deals with certain aspects of each of the three analyses.)

"Contrary" vs. "Contradictory" Opposition

Turning now to the "contrary" vs. "contradictory" opposition proposal: Choi claims that the distinction between the use of Short NEG and Long NEG can best be characterized in terms of the Aristotelian semantic opposition "contrary" vs. "contradictory", rather than in terms of verbal vs. sentence negation. He views Short NEG usage as instances of "contrary" opposition, and Long NEG, in some but perhaps not all instances, as "contradictory" opposition. In a contrary opposition, both members signify universally and, therefore, while both members cannot be true, it is possible that neither is true. An example provided in Horn (1978)[1] of a contrary opposition gives the universally signified affirmative and negative counterparts in (6).

(6) Every man is just. // No man is just.

An affirmation and negation are contradictory when one member signifies universally and the other member does not signify universally. In such an opposition, the range of possibilities are exhausted in that one member must be true and the other false. Borrowing an example again from Horn (1978), a contradictory affirmative/negative opposition is given in (7).

(7) Every man is white. // Not every man is white.

Choi applies this Aristotelian analysis to scalar predicates in Korean. Horn (1985) discusses the negation of scalar predicates at length as an instance of metalinguistic negation in that scalar predicate negation is marked as metalinguistic when it gives a "more than" or "other than" reading instead of the unmarked, descriptive "less than" reading. An example is given in (8).

(8) a. Descriptive "less than" reading
She is not pretty.

b. Metalinguistic "more than" reading
She isn't pretty. She is beautiful.

c. Metalinguistic "other than" reading
She isn't pretty. She is intelligent.

Based on Horn's metalinguistic analysis, Choi presents the following Korean data and claims that the unacceptability of Short NEG is due to the fact that scalar predicates are instances of contradictory opposition and, therefore, require Long NEG. His Korean data are presented in (9) and (10).

(9) a. ? ku yeca nun an yeyppu-ko alumtawe.
that woman not pretty beautiful

b. ku yeca nun yeyppu-ci ani hako alumtawe.
`She isn't (just) pretty. She is beautiful.'

(10) a. ? ku yeca nun an yeyppu-ko kaysengcek-iya.
individualistic

b. ku yeca nun yeyppu-ci ani hako kaysengcek-iya.
`She isn't pretty. She is individualistic.'

Choi asserts that the unacceptability of the (a) sentences in (9) and (10), in which Short NEG is used, is due to the metalinguistic nature of the negation: (9) having a "more than" reading and (10) an "other than" reading. Since he views this type of scalar predicate negation as involving contradictory opposites, Short NEG is ruled out due to its "contrary" opposition nature.

It seems that Choi has left out a significant point in his analysis of this being the reason that Long NEG is more acceptable with Korean scalar predicates than Short NEG. The point that is missing in the analysis is that stative verbs in Korean favor Long NEG regardless of whether the reading is descriptive negation ("less than" for scalar predicates) or metalinguistic ("more than" or "other than"). In (11) a descriptive "less than" reading is presented and the acceptability judgments are consistent with those for the metalinguistic readings in (9) and (10).

(11) a. ? ku yeca nun an yeyppupnita.
that woman not pretty

b. ku yeca nun yeyppu-ci ani hapnita.
`That woman is not pretty.'

The difference in acceptability between (11a) and (11b) is due to the fact that Short NEG is disfavored by stative verbs in Korean. This fact holds regardless of whether the negation is descriptive as in (11) or metalinguistic as in (9) and (10). Short NEG is also disfavored by polysyllabic verb stems, as Choi pointed out in arguing against Kuno's (1980) analysis.[2] On two counts, then, the Korean verb yeypputa `to be pretty' disfavors the Short NEG. Kim-Renaud (1974) presents the results of an empirical study attesting to the disfavoring of Short NEG by stative and polysyllabic verbs. The speakers with whom I consulted consistently found Short NEG to be much less preferable than Long NEG with stative verbs.

Furthermore, there was a qualitative difference in the distinction made by speakers when judging Short and Long NEG acceptability with stative and nonstative verbs. Acceptability preferences with nonstative verbs are most often quite subtle if present at all. However, acceptability preferences with stative verbs are much more definite, with speakers judging Short NEG to be "extremely strange" or "not possible". This disfavoring of Short NEG with stative verbs appears to be consistent regardless of " less than", "more than", or "other than" reading.

Perhaps it would be possible to make an argument that nonstative verbs disfavor Short NEG because the potential of all three types of negative readings ("less than", "more than", and "other than") exists with such verbs and, therefore, they require the "contradictory" opposition type of negation. This seems unlikely, however, since such a potential is also present in nonstative verbs and yet they do not disfavor Short NEG.

The second argument that Choi makes in favor of the "contrary" vs. "contradictory" distinction to differentiate between Short and Long NEG in Korean concerns pragmatic presupposition. The Short NEG is judged acceptable as an answer to a question in a situation in which a presupposition shared by the two speakers involved limits the focus of what is being asked to a "contrary" opposition situation. Choi's data is presented in (12) and (13).

(12) Speaker A: i cip sasseyo?
this house bought
`Did you buy this house?'

Speaker B: a. ? aniyo, an sako pillyesseyo.
borrowed

b. aniyo, sa-ci ani hako pillyesseyo.
`No, (I) didn't buy. (I) borrowed (it).'

The data in (12) are without presuppositional material and Long NEG is preferred. Within the following contextual situation, Choi feels that Short NEG can be used, resulting in the sentences in (13).

(13) Situation: "If Speaker A knows that Speaker B was going to buy the house which both Speaker A and Speaker B knew and that at that time Speaker B was indecisive about whether he/she wanted to buy it or not, and then ... Ba is as acceptable as Bb."

Speaker A: ku ttay ku cip sasseyo?
that time that house bought
`Did you buy that house?'

Speaker B: a. aniyo, an sako pillyesseyo.

b. aniyo, sa-ci ani hako pillyesseyo.
`No, (I) didn't buy (it). (I) borrowed (it).'

According to Choi the acceptability of Short NEG in (13) is sanctioned by the fact that the presuppositional material sets up a "contrary" opposition.

For some speakers there does not seem to be a distinction in the acceptability of Short NEG regardless of the presuppositional material involved. Given the situations in (14), (15) and (16), a number of speakers preferred Long NEG to Short NEG regardless of the presuppositional material involved.

(14) Situation: Speaker A sees Speaker B driving a new car and, knowing that Speaker B did not previously own a car, asks Speaker B the question.

A: catongchalul sasseyo?
car bought
`Did you buy a car?'

B: a. ? aniyo, an sako pillyesseyo.

b. aniyo, sa-ci ani hako pillesseyo.
`No, I didn't buy it. I borrowed it.'

The situation presented in (14) is of the type considered by Choi to be a contradictory opposition and thus it would be predicted that Long NEG would be preferred. The data supports that prediction.

(15) Situation: Speaker A knows that Speaker B is considering buying certain car and Speaker B knows that fact. Speaker A knows that Speaker B planned to look at the car the previous day. Speaker A asks Speaker B the question when he sees him after Speaker B was supposed to look at the car:

A: ku catongchalul sasseyo?
the car bought
`Did you buy the car?'

B: a. aniyo, an sasseyo.

b. aniyo, sa-ci ani haesseyo.
`No, I didn't buy it.'

The situation in (15) is a "contrary" opposition and thus should allow Short NEG. This prediction does not hold for the data in (15) however.

(16) Situation: The situation is the same as in (15) except that Speaker A sees Speaker B in the car that B was considering buying and asks:

A: ku catongchalul sasseyo?
the car bought
`Did you buy the car?'

B: a. ? aniyo, an sako pillyesseyo.
buy borrowed

b. aniyo, sa-ci ani hako pillyesseyo.
`No, I didn't buy it. I borrowed it.'

A situation is presented in (16) where the presuppositional material is supported by the fact that Speaker B is actually driving the car in question. According to Choi's claim, Short NEG should be allowed in such a situation. Long NEG, however, is preferred in this situation.

In all three situations presented above, the preferred response is with Long NEG. it should be noted, however, that Long NEG was the preferred response, not the only acceptable response. In no case did the speakers rule out the use of Short NEG; they simply stated that they would use Long NEG. Since the situations varied in terms of Choi's "contrary" vs. "contradictory" opposition status, but the acceptability judgments did not vary, I was not able to get a reading which supported the use of Short NEG in the case of "contrary" opposition and Long NEG in the case of "contradictory" opposition.

Short NEG as Unambiguously Descriptive?

Horn (1985) suggests that Korean is perhaps a language in which there is an unambiguous distinction between descriptive and metalinguistic negation in the sense that Short NEG can be used only descriptively while long NEG may be used either descriptively or metalinguistically. This suggestion is not strongly supported by Choi's data, however, if we accept the disfavoring of Short NEG by stative verbs as the reason for Long NEG being preferred in scalar predicate situations rather than viewing the reason as one of "contrary" opposition.

An additional piece of evidence against Short NEG being used only for descriptive negation concerns the usage of a scalar predicate which does not involve a stative verb. Horn cites the sentence in (17) as an example of a metalinguistic scalar predicate negation.

(17) Max doesn't have three children -- he has four.

In this example the proposition that Max has three children is not negated, but rather the implicature that he has only three children is negated.

Song (1982) presents a similar example in which Short NEG may be used for this type of metalinguistic negation.

(18) John-i sakwa-lul tu kay ani mekessta.
apple two piece NEG ate
`Two apples, John didn't eat.'
`John didn't eat two apples.'

This sentence could be used to assert simply that John did not eat two apples, that is, he ate less than two apples, in which case it would be descriptive negation. However, Song points out that it can be used to

assert that John ate more than two apples. This is shown in the expanded sentence in (19).

(19) John-un sakwa-lul tu kay an mek-ko yele kay mekessta.
eat-and several
`John didn't eat two apples but several.'

The reading in (19) is an example of metalinguistic negation and Short NEG is used. This data indicate that Short NEG in Korean is not unambiguously descriptive as Horn suggests.

Other Pragmatic Possibilities

The question remains then that (1) if the choice between Short and Long NEG is not based on a verbal as opposed to a sentential scope distinction, nor on a "contrary" vs. "contradictory" opposition distinction, and (2) if Short NEG is not unambiguously descriptive, what influences the choice of Short or Long NEG (aside from Short NEG being disfavored by stative and polysyllabic verbs)? The two possibilities that I have to offer are based on data from and discussions with native Korean speakers but are admittedly quite speculative. In view of the subtlety of the distinctions which speakers make in preference of one form over another, speculative offerings do not seem as inappropriate as they might otherwise.

First, the choice between Short and Long NEG seems to be made by some speakers (especially younger speakers)[3] in terms of the "casualness" of the conversational situation. As well as I could determine, by "casualness" the speakers were referring to speech used in normal, everyday conversation between peers. In ordinary conversation, they were inclined to use Short NEG more than Long NEG unless Short NEG was disfavored for some specific reason, such as stativeness or polysyllabicity.

Kuno (1980) points out that the younger generation of Koreans tend to use Short and Long NEG interchangeably. I found that with the exception of stative verbs, there actually seems to be a preference for Short NEG in everyday conversation. It was also indicated that the more formal the conversation setting, the greater the tendency to use Long NEG. This suggests that younger speakers choose between Short and Long NEG on the basis of the pragmatics of the conversational setting rather than on syntactic or semantic grounds. A possible way of testing this tentative hypothesis would be to determine if among younger speakers there is a positive correlation between a greater incidence of Long NEG usage and the use of the declarative sentence endings indicating deference to the addressee. If lexical items and sentence endings are selected in part on the basis of the speaker's relationship with the addressee and the relative status (in terms of age, position, etc.) of the conversational participants as they seem to be in Korean, it does not seem out of the range of possibility that, presented with a choice of two negation possibilities, a speaker would make that choice based on the same type of criteria.

The second possibility I would like to suggest is that for those speakers who prefer Short NEG in casual conversation, Long NEG is

frequently used in situations in which the focus of the conversation involves a decision-making process. The following situations and sentences illustrate what I am referring to by a decision-making focus situation.

(20) Situation: Speaker A knows that Speaker B is planning to move and that one possibility under consideration is buying a house:

Speaker A: cipul sasseyo?
house bought
`Did you buy a house?'

Speaker B: a. aniyo, an sasseyo.
NEG bought

b. aniyo, sa-ci anhasseyo.[4]
buy NOM did not
`No, I didn't buy one.'

In the above interchange, the speaker made no differentiation whatsoever in preferring Short of Long NEG (but Short NEG was the first response), presumably because he was not focusing on the decision process involved in buying or not buying a house, but simply on the fact that up to the present time he had not bought one. Contrast (20) with (21) and (22) in which the decision process is focused on. (In these examples the focus is forced by the use of the lexical item kyelceng hata `to make a decision, to decide'.

(21) Situation: Speaker A knows that Speaker B was giving serious consideration to buying a particular house and Speaker B knows that Speaker A knows that fact.

Speaker A: ku cipun sakilo kyelceng haysseyo?
the house buy decision do
`Did you decide to buy the house?'

Speaker B: a. ? aniyo, acik kyelceng an haysseyo.
yet NEG

b. aniyo, acik kyelceng ha-ci anhasseyo.
NOM did not
`No, I didn't decide yet.'
`No, I haven't decided yet.'

In (21) the speaker asserts that he has not made the decision of whether or not to buy the house in question. It should be noted that the Short NEG is not judged to be unacceptable in this case; it is however at least somewhat less preferable than Long NEG. A similar preference judgment is made in (22).

(22) Situation: Identical to that in (21).

Speaker A: ku cipun sakilo kyelceng haysseyo?
`Did you decide to buy the house?'

Speaker B: a. ? an sakilo kyelceng haysseyo.
NEG buy decision did

b. sa-ci an hakilo kyelceng haysseyo.
NOM NEG do
`I decided not to buy it.'

In (22) the speaker asserts that he has made a decision not to buy the house. Again, it should be noted that Short NEG is not judged to be unacceptable in this case, but simply somewhat less preferable than Long NEG.

The decisional situations presented in (21) and (22) in which Long NEG is preferred are not necessarily unrelated to the idea of "casualness" discussed earlier. I am suggesting that, by speakers who generally prefer Short NEG, Long NEG is perhaps selected when making an assertion about something which they view as especially important or serious, particularly if the speaker has in mind the decision process rather than focusing on the activity referred to by the verb.

Summary

The claim made by Choi (1985) that the difference between Short and Long NEG can best be explained in terms of the Aristotelian opposition of "contrary" vs. "contradictory" is not well supported when Long NEG preference by stative verbs is considered. In light of data which shows Short NEG usage for metalinguistic negation, Horn's (1985) suggestion that Short NEG is unambiguously does not seem to be a viable one.

I suggest that the choice of Short or Long NEG by Korean speakers, especially by younger speakers, may be influenced by the casualness of the conversational situation and the importance which they attach to the subject under discussion,. Short NEG seems to be preferred as the unmarked from in casual speech with Long NEG used when the speaker is focusing on a decisional process rather than on the action denoted by the verb.

NOTES

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[1]The examples from Horn (1978) are quoted from Choi (1985).

[2]Kuno (1980) attributes the unacceptability of Ba (below) to the fact

that Short NEG is used for verb negation and Ba is an instance of sentence negation, requiring Long NEG. Choi (1985) disagrees, stating that the unacceptability is due to the polysyllabic verb stem.

Speaker A: 1960-nyeney thayenassupni-kka?
year was born Q
'Were you born in 1960?'

Speaker B: a. ? Aniyo, 1960-nyeney an thayenassupnita
b. Aniyo, 1960-nyeney thayena-ci anhassupnita.
'No, I wasn't born in 1960.'

[3]By "younger speakers" I am referring to university undergraduate and graduate students.

[4]In Long NEG structures, an(i) hata is usually shortened to anhta.

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UMLAUT IN KOREAN

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Korean has a vowel fronting rule or umlaut in a few nouns and verbals. What I attempt to do in this paper is to examine both phonological and morphological constraints on the umlaut process and suggest an alternative analysis. In this analysis, the distinction between non-affixational umlaut vs. affixational umlaut will be made. In Seoul dialect, the umlauted variant is usually used in an informal context. Its informal nature will be examined and be related to the productivity of umlaut.

It has been noted that Korean has a vowel fronting rule or umlaut whereby a few nouns and verbals have optional vowel alternations such as a ~ æ, ə ~ e, o ~ ö, u ~ y, ɨ ~ i as shown in (1a-b) in which (1a) shows nouns while (1b) shows verbals.

(1) a. a ~ æ : agi ~ ægi `baby', abi ~ æbi `father', cami ~ cæmi `fun'

ə ~ e : əmi ~ emi `mother'

o ~ ö : kogi ~ kögi `meat'

u ~ y : cuin ~ cyn `owner'

b. a ~ æ : caphi ~ cæphi `to be caught'

namgi ~ næŋgi `to leave'

ə ~ e : məgi ~ megi `to feed'

məkhi ~ mekhi `to be eaten'

o ~ ö : sogi ~ sögi `to cheat'

ccotki ~ ccötki `to be chased'

u ~ y : cugi ~ cygi `to kill'

ɨ ~ i : ttɨtki ~ ttitki(ttikki) `to be plucked'

One apparent fact about umlaut is that the high front i triggers this process either intermorphemically or morpheme-internally. Since it involves certain phonological constraints, it has been considered as a part of Korean phonology. However, since it also involves a number of exceptions from the phonological point of view, morphological constraints

are invoked as well. While both phonological and morphological analyses assume that umlaut is a synchronic phonological rule, this assumption is called into question in S-G. Kim (1976) in which the above alternations are treated as two variants, only one of which is put to use by speakers unconsciously and the other is used consciously in certain contexts. According to Kim, the dialectal difference is responsible for the selection of one variant for unconscious use over the other, and the relationship between the two variants are listed in the lexicon by a via rule.

The earlier discussions about umlaut will not be reviewed in detail but several points will be mentioned with respect to the present discussion. What I attempt to do here is to examine both phonological and morphological constraints on the umlaut process and suggest an alternative analysis in which the umlaut process will be grouped into two kinds, i.e. non-affixational vs. affixational. In this analysis non-affixational umlaut will be described as a morphological rule while affixational umlaut will be treated as a productive string dependent rule which is introduced in Lieber (1981). The morpholexical rule is similar to a via rule in the sense that it applies to a small, arbitrary set of forms, while the productive string dependent rule applies to any form which meets the structural description.

The data which I use here is based on standard Seoul dialect in which the forms derived by umlaut is used in a rather informal context. With regard to its informal nature, the further connotations which the umlauted variants may have will be examined and be related to the productivity of umlaut.

I. Phonological constraints

As mentioned before, umlaut is conditioned by high front vowel i. Except the cases in which vowels [a, ə, o, u] become [æ, e, ö, y] respectively when they are immediately followed by high front i e.g. /ca+iu/ [cæu] `to put to sleep' /sə+iu/ [seu] `to erect', /poita/ [pöta] `to be seen' /nuita/ [nyta] which can be described in terms of a vowel coalescence rule, umlaut occurs when the intervening consonant is a [-coronal]. Thus, umlaut takes place when the intervening consonant is p, m, n, k, kk. However, when the consonant such as l, s, c, ch, n, t intervenes two vowels, umlaut does not take place because it divides the distance between two vowels and thereby neutralizes the regressive assimilatory power of vowel i as discussed in S-N. Lee (1957). The following examples show that umlaut is triggered when the intervening consonants are [-coronal]:

(2) a. agi ~ ægi `baby'; tali ~ *tæli `foot'

b. ciphañi ~ ciphæñi ; paci ~ *pæci `pants'

c. pocagi ~ pocægi `cloth wrapper' ; machi ~ *mæchi `as if'

d. əmi ~ emi `mother' ;kasi ~ kæsi `thorn'

The following examples also support the fact that the intervening consonant

must be [-coronal]:

(3) a. matkita -> makkita -> mækkita, *mætkita `to entrust'

b. namgita -> nañgita -> næñgita, *næmgita `to leave'

c. hankil -> hañkil -> hæñkil, *hænkil `broad street'

When the intervening consonant is [+coronal], that consonant is also assimilated into [-coronal] and then umlaut is applied. As C-W. Kim noted, German is quite free of such constraints, because there exist examples like Mann-Männer, Gott-Götter. It is rather peculiar that the nature of intervening consonants controls umlaut in Korean since other languages do not seem to have such constraints.

C-W. Kim (1973) used the peripheral vs. central distinction in describing umlaut and tried to establish the relation between umlaut and centrifugality. According to him, umlaut takes place only when the intervening consonant is a peripheral one since it can neutralize the centralization by umlaut but umlaut is prevented when the intervening consonant is a central one for if it is allowed, it will create too much centrality assuming that there is a counterdirectional centrifugal tendency in Korean.

Phonetically speaking, there is quite a distance between back vowels a, ə, o and front vowel i from the articulatory point of view. Since that distance causes a great deal of tongue movement, umlaut makes it possible to save the tongue effort by fronting the back vowels into æ, e, ə, etc. This economy of effort seems to be related in a sense to the fact that the umlauted variant is usually used in a relaxed informal context. In a relaxed speech, it is more likely that one uses the forms which require less effort in articulatory terms.

2. Morphological constraints

Despite the apparently phonological nature, a purely phonological approach cannot succeed because it cannot account for the fact that the homophonous affixes with i sometimes trigger umlaut but sometimes do not. For that reason, morphology has to play a role in describing umlaut in Korean. Umlaut is conditioned by the presence of certain suffixes which have the form of (C)i in a derived word. There are a number of suffixes having a form of i. While causative, passive and nominalizer suffixes condition umlaut, adverbializer, nominative and copula suffixes do not, as shown in (4):

(4) a. Causative -i, -hi, -ki/ Passive -i

a ~ æ : angi ~ æñgi `to be embraced'

caphi ~ cæphi `to be caught'

ə ~ e : məkhi ~ mekhi `to be eaten'

nəmgi ~ neñgi `to pass'

o ~ ŏ : sogi ~ sŏgi `to deceive'

ccotki ~ ccŏtki `to be chased'

u ~ y : cugi ~ cygi `to kill'

ɨ ~ i : ttɨtki ~ ttitki `to be plucked'

kkukita ~ kkwikita `to crumple'

b. Nominalizer -i

a ~ æ : ciphañi ~ ciphæñi `stick'

ə ~ e : məgi ~ megi `food'

o ~ ŏ : macpogi ~ macpŏgi `plain glass'

c. Adverbial -i

ppalli, *ppɛlli `fast'

məlli, *melli `far'

koi, *kŏi `beautifully'

d. Nominative / Copula -i:

cam-i, *cæmi `sleep'

cak-i, *cek-i `enemy'

coñ-i, *cŏñ-i `bell'

cuk-i, *cyk-i `soup'

Likewise, the deverval derivational suffix -ki can sometimes trigger umlaut while the gerundive suffix -ki does not:

(5) a. Deverbal -ki

macpogi ~ macpŏgi `olain glass'

b. Gerundive -ki

po-ki, *pŏgi `seeing'

sum-ki, *symgi `hiding'

Since certain forms of -(C)i never alternate with umlauted forms, morphological constraints are needed in describing this process. Thus, both phonological and morphological constraints are involved in umlaut

phenomena in Korean. Despite its sporadic nature due to morphological constraints which often make synchronic phonological rule complicated, umlaut must be seen as a phonologically alternating process which is conditioned by morphology.

Assuming that both constraints are utilized in this process, I will suggest an analysis in which non-affixational process and affixational one are distinguished and each should be viewed in terms of morpholexical and string dependent rule respectively using Lieber's terminology.

Lieber (1981) proposed two logically possible analyses for German umlaut, i.e. morpholexical and string dependent rules and argued that German umlaut phenomenon must be treated in terms of string dependent rules rather than morpholexical rules. Morpholexical rules relate umlauted non-umlauted stem variants in the permanent lexicon. Meanwhile, within a productive string dependent rule analysis, suffixes are divided into either [+U] or [-U] in the permanent lexicon and at the stage in which stems and affixes are put together, a vowel is fronted when followed by a morpheme bearing [+U]. Lieber adopts the latter analysis which refers to segmental properties of the items over the former one which defines just unpredictable variation in the stem forms. What is more suitable for Korean umlaut, however, is an analysis which utilizes both kinds of rules because umlaut process in Korean not only includes productive rules sensitive to the segmental nature of the string but also includes arbitrary morpholexical rules which state the relation between two variants. In Korean, there is a limited set of lexical items which have umlauted variants. What characterizes this set of items is that umlaut takes place morpheme-internally.

(6) agi ~ ægi `baby' : cami ~ cœmi `fun'

api ~ æpi `father' : pocaki ~ pocœki `wrapping cloth'

əmi ~ emi `mother' : nambi ~ nœmbi `pan'

Whether a given lexical item has its umlauted variant or not is a quite arbitrary matter since a lexical item which meets the same phonological environment does not have umlauted variants:

(7) nabi, *nœbi `butterfly'

homi, *hœmi `weeding hoe'

While it is the case that front high vowel i of the items in (7) came from *ɨ historically and thereby did not meet the umlaut conditioning, such historical facts are not longer available in synchronic phonology. Thus, for those limited times, morpholexical rule states that a given lexical item is related to its umlauted variant in the lexicon as in (8):

(8) $[C_o\ [\ V\ ]\ C_o]$ $[-\delta or]\ [-U]^o$ $[C_o\ [\ V\ ]\ C_o]$ $[-\delta or]\ [+U]^o$

a. agi ~ ɤgi

b. əmi ~ emi

c. cami ~ cæmi

The relation defined by morpholexical rules is a phonological one in the sense that phonological constraints to umlaut are still operative. According to Lieber (1981), the relations defined by morpholexical rules mimic the sorts of relationships defined by more productive morphological processes. Though morpholexical rules are just classificatory, they are subject to the same phonological constraints as productive string dependent rules which will be discussed later. In the examples like (6), it can be noted that one's use of one variant between two forms is not conditioned by any given context. In other words, its umlauted variant as well as non-umlauted one can be freely used in the formal context.

The following examples which also involve non-affixational umlaut should be distinguished from the above case in the sense that the umlauted variant is used only in informal situations:

(9) a. tomi ~ tœmi `sea-bream'

b. kogi ~ kœgi `meat'

c. thokki ~ thœkki `rabbit'

The relation between two variants should be also defined by a morpholexical rule for the above items. However, another diacritic [+informal] should be associated with the umlauted variants. In general, the umlaut process by itself does not affect category, subcategorization or semantic representation (Lieber:1981). It is a quite idiosyncratic nature of Korean umlaut that umlauted variants are related to informal situations. More often than not, umlauted variants can even convey vulgar, low and bad connotations. The relationship between umlaut and informality will be further examined with regard to umlaut which occurs in affixational processes which involve nominalizer, deverbalizer, causative and passive suffixes.

Derivational suffixes are divided into either [+U] or [-U] in the lexicon. Thus, affixes which trigger umlaut such as causative, passive, and nominalizing suffixes are specified with [+U] while adverbial, subject marker, copula-i are specified with [-U]. When stems and affixes which carry a diacritic [+U] are put together during the derivation, umlaut takes place if the stem is followed by a suffix bearing [+U], as represented in (10):

(10) suffix -i: semantic representation: Causative
or
Passive
Nominalizer

subcategorization: $]_V$ $]_V$ (Causative/Passive)
$]_V$ $]_N$ (Nominalizer)

diacritic: [+U]

For instance, the representation of the verb cap- `to catch' will be like (11):

(11) [[cap- $]_V$ hi $]_V$
Pass
[+U]

Once umlaut is triggered by a diacritic [+U], a productive phonological rule stated in (12) comes into play and a vowel of the stem gets fronted:

(12) Umlaut: V -> [-bk] / ___ C [+U]
[+bk] [-cor]

The same process applies in nominalizing affixation as in (13):

(13) [[mək- $]_V$ i $]_N$
Nominal
[+U]

What characterizes the umlaut process which involves affixation is that the derived umlauted variant is usually used in the informal context. Its informal use seems to make umlaut process productive in some sense in verbal stems and nominals. The informal nature is further connected to slangish, vulgar shades of meaning. This can be better seen when the context is given as in (14):

(14) a. mal an tulumyen cykinta.
word NEG listen-if kill
`I'll kill you if you don't listen to me'

b. ku nun anæ eykey cayphyet -ta.
he top wife by be caught-past
`He is henpecked'

c. wu nun ayki lul æñgyət-ta.
crying baby -Obj. let hold-past
`he was left holding the crying baby'

d. mul meyki-ca
water feed-let's
`let's hassle him'

Not all the umlauted variants are connected to slangish, low connotations. But they are always used in an informal situation. One extreme case which reveals the special use of umlaut with bad connotations can be noted in fossilized nominals given in (15):

(15) a. ap cap-i `guide' vs. ap cæp-i `agent'

b. p'algañ-i `red one' vs. p'algæñ-i `communist'

c. nolañ-i `yellow object' vs. nolæñ-i `miser'

d. nulañ-i `brownish yellow object' vs. nuleñ-i `(very common) yellow dog'

In (15), the items on the left side do not alternate with umlauted forms. Though this case is restricted to a few lexical items, it is very unusual that the presence of umlaut can cause the meaning difference. Interestingly enough, the umlauted items carry bad connotations. The examples like the above make the argument weak which relates the use of one variant over the other to the dialectal, sometimes idiolectal difference. Another example which shows special use of umlaut can be seen in (16):

(16) a. poki silt^{h}a ~ pöki silt^{h}a ~ peki silt^{h}a
see-deverbal don't like
`I hate; it's ugly'

b. poki cot^{h}a, *pöki cotha, *peki cot^{h}a
like
`I like; it's pretty'

-ki in (16a-b) is a deverbalizing suffix which can trigger umlaut. However, only when it is followed by a word which has a negative meaning, umlaut can take place as in (16a).

Given the assumption that umlaut in the affixational processes takes place within an informal context, it can be said that umlaut is not an unpredictable process which applies only to a limited set of lexical items but a productive process which can be predicted by a rule. What I suggest is that arbitrary and unpredictable facts such as morpheme-internal umlauted variants or umlaut triggering vs. non-triggering suffixes should be specified in the lexicon by morpholexical rules and diacritic features respectively while general and predictable facts like umlaut in affixations must be treated in terms of rules. Within this analysis, whether a given suffix triggers umlaut [+U] or not [-U] belongs to an arbitrary fact which should be specified in the lexicon. However, the umlaut process which happens when a [+U] suffix is attached to a stem is not arbitrary at all but rather governed by a rule which has phonological constraints. If we assume that the umlaut process can be treated by morpholexical rules alone, we have to list individual stems which have umlauted variants in the lexicon. But given the present analysis, only a single stem form is

required in the lexicon and the umlauted variant is derived in the derivation, which achieves a great deal of economy in the part of the lexicon. Another fact which seems to be language-specific but nevertheless cannot be overlooked in Korean umlaut is that the umlaut process usually takes place within informal contexts. The informal use of umlaut also supports that this process is not a close-ended phenomenon but rather productive in that a speaker can have umlauted variants in derivational morphology when he tries to convey informal, slangish effects. The analysis which confines umlaut to morpholexical rules can also give an account for the umlaut process but cannot make any predictions about potential umlaut forms which individual speakers and dialects can have.

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TOWARD AN INTEGRATED THEORY OF MORPHOPHONOLOGY: VOWEL HARMONY IN KOREAN

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The present study proposes a more restrictive account of Korean vowel harmony on the basis of the theory of underspecification and nonconcatenative morphology. I argue that the harmony is based on the morphological process and that the harmony feature is a feature-sized morpheme [+low], but not [-low]. As a consequence of the underspecification of features, the feature value of the feature [low] is predicted to be '+', and this prediction is borne out. Within this proposal, the dark ideophone feeds the input to the word formation process and the light ideophones are derived from their dark counterparts. Thus, dark and light harmonic dichotomy is realized by way of nonconcatenative association of a feature-sized morpheme. From this follows the empirical difference between the vowel harmony of ideophones and that of the verbal morphology: one is conditioned by a morpheme and the other by a feature which is not free to spread due to its intrasegmental constellation on a melody tier.

The vowel harmony process of Korean has been one of the frequented topics of Korean phonological studies (C.-W. Kim 1976, Kim-Renaud 1976, McCarthy 1983, C.-W. Kim and Ahn 1984, Y.-S. Kim 1985, and Ahn 1985, among others). Major difficulties in dealing with the vowel harmony phenomena are due to the phonological and morphological reasons.

From the viewpoint of phonology, the harmonizing vowels do not form a natural class, as shown in (1):

(1)

	i	ɨ	ʌ	u
	e	/ə/	ə	/o/
	æ		a	

Vowels above the line are the so-called "dark" vowels, whereas those below the line are "light" vowels. Since the two round vowels below the line are not low vowels, classification of the harmonizing vowels into two categories in terms of a phonological feature is impossible within the vowel system as in (1).

From the viewpoint of morphology, on the other hand, there is no affixal morpheme that brings the light and dark distinction in semantic

meaning. Consider the examples in the following:

(2) a. phuñdəñ `dark aspect of plunging'

b. phoñdañ `light aspect of plunging'

The dark ideophone in (2a) carries a bigger motion of plunging, while the corresponding light one in (2b) represents a relatively small motion. This semantic distinction is carried by the distinction of vocalism u-ə vs. o-a, which has traditionally not been regarded as morpheme-based.

The present study, thus, attempts to provide a synthetic account of these two seemingly discrepant questions, by integrating the recent developments of phonological and morphological theories. Representing segments in terms of the underspecification of features, I will argue that vowel harmony with respect to relative height is not an ad hoc system in the synchronic grammar of Korean. The feature [+low] is not only the phonological feature that controls the harmony, but a morphological feature as in McCarthy (1983). Unlike in McCarthy, however, I will argue that dark forms feed the input to the derivation of the corresponding light forms. That is, the phonological representation of the dark form, not a third abstract form which never surfaces, must be entered in the lexicon. I will also show that the harmony process of ideophones is distinguished from the so-called harmony in the verbal morphology in the synchronic grammar.

In what follows, an eight vowel system of Korean as shown in (3), rather than ten vowel system as in (1) is assumed (Sohn in preparation), deriving the two front round vowels from the corresponding diphthongs. However, we will not go into details since it is not directly relevant to the present discussion.

1. Theoretical Backgrounds

Morphophonological investigation of vowel harmony in Korean has been made possible by the recent developments of the theory of underspecification on the one hand, and the nonconcatenative morphology and studies of the lexicon on the other.

In recent phonological studies, issues of simplicity and phonological cost from the perspective of language learner have been a major concern in providing phonological explanation of both segmental and suprasegmental phenomena. Particularly of interest in the present study is the theory of underspecification (Kiparsky 1982, 1983, Pulleyblank 1983, Archangeli 1984, Borowsky 1985). Within this theory, any feature or feature value which is predictable on either universal or language particular grounds is kept from being specified in the underlying representation. Thus, the distinctive features for vowels such as high, back, round, low, and in some language ATR are not all specified in the underlying representation. Universally, [+high] is coefficient with [-low] and [+low] with [-high]. Therefore, one of the features is redundant to the other. In case of a language with five vowels /i, e, a, o, u/, the feature [-round] is redundant in front and low vowels. Thus, the segment which is underlyingly specified with [-back] or [+low] does not have to be specified with a round feature at all. The

system of the underlying representation is further constrained so that no feature is specified on all segments, nor is any feature specified with both feature values `+' and `-'. As a consequence, phonological rules are simplified since there are much fewer features available at the point of rule application. The incohate feature matrix becomes full fledged for phonetic representation as late in the phonology as possible' (Pulleyblank 1983, Archangeli 1984).

Determination of the totally unspecified feature matrix on the basis of language particular information gives a clue as to which feature value is not to be specified in the underlying representation. Noticing the asymmetry of the vowels with respect to the epenthetic process, Archangeli (1984) shows that the vowel which turns out to be epenthetic is assumed to be the least marked. That is, the segment which is spelled out consistently for the inserted vowel is the one totally unspecified in the underlying representation. In this way, the least marked segment of a language is encoded in the underlying system. In the case of Yawelmani, the feature values for the epenthetic vowel [i] are not allowed in the underlying representation. To put it differently, it is [-high], [+low], [+back], and [+round] that may appear in the underlying feature matrices. It is notable at this point that by preventing the opposite feature value from appearing in the underlying feature matrices, vowels in the underspecified system are `potentially distinct', and become truly distinct once values are assigned.

It is argued in Sohn (1986) that the asymmetry of the vowels is observed with respect to deletion as well, providing evidence from the Korean $\dot{+}$-deletion phenomenon. The vowel [$\dot{+}$] being the least marked, the features for the vowel [$\dot{+}$] ([+high], [+back], [-round], and [-low]) are unspecified and an underspecified system of Korean results, as given in (3).

(3) Underspecification

	i	e	æ	a	ə	o	u	$\dot{+}$
[back]	-	-	-					
[round]						+	+	
[high]	-				-	-		
[low]			+	+				

In the underlying representation in (3), the vowel [$\dot{+}$] is totally unspecified so that it can be asymmetrical to the rest of the vowels in terms of the emptiness of the feature matrix. The underlying representation of Korean vowels in (3) is well represented in that the eight vowels are potentially distinct. [-high] is not underspecified for /æ/ and /ə/, since [-high] is redundant to [+low] specification. None of the four features in (3) can be omitted from the underlying representation since, otherwise, a non-potentially-distinct segment would result in the underlying representation.

Essential to the underspecified system are the redundancy rules which fill in the unspecified features, as given in (4).

(4) Redundancy rules

A. default rule

a. [ ] ---> [-high] / $\begin{bmatrix}+\text{low}\\---\end{bmatrix}$

B. complement rules

b. [ ] ---> [+high]
c. [ ] ---> [+back]
d. [ ] ---> [-round]
e. [ ] ---> [-low]

By the Elsewhere Condition (Kiparsky 1982), the more specific rule (4a) applies prior to (4b).

As phonological studies on tonal phenomenon, reduplication, and vowel harmony (Goldsmith 1976, Halle and Vergnaud 1981, Marantz 1982, Yip 1982) have provided evidence for nonlinearization of features into autosegmental tiers, morphological studies also developed partitioning morphemes into smaller units, as extensively discussed in McCarthy (1979, 1981, 1982, 1983, 1986). His motivation of nonconcatenative morphology originates from the Semitic root morphology. The morpheme /ktb/ `to write', for example, represents various semantic meaning according to which template it enters. The template provides linearization of the two nonlinear planes of root consonant and vocalisms. Thus, the traditional notion of word formation as a concatenation of morphemes in tandem must be broadened enough to allow nonconcatenative morphemes.

Study of the organization of the lexicon (Lieber 1980), on the other hand, has made possible this point of view on morphology by allowing autonomy of word formation process. That is, syntactic trees as an output of word formation in the lexicon is not solely responsible for the semantic interpretation. As a result, cranberry, for example, does not necessarily have to mean some berry related to cran. Therefore, there is nothing that bars division of cranberry into two morphemes of cran and berry. Thus, as McCarthy puts it, "word formation is generalized from simple concatenation of morphemes to the assembly of forms by the association procedures of autosegmental phonology". Within this view, morphemes range from actual word to a single phonological feature.

Based on the phonological theory of underspecification and the morphological theory of nonlinear concatenation, we now turn to the analysis of Korean vowel harmony process.

2. Vowel Spreading

In this section I will show that the harmony process is best captured by leaving some vowel slots unspecified for the melody and having them specified by a phonological rule of spreading.

Consider first some ideophones in (5):

(5)

	Dark	Light	
a.	k'əñchuñ-k'əñchuñ	k'añchoñ-k'añchoñ	`hopping'
b.	chulləñ-chulləñ	chollañ-chollañ	`waving'
c.	mulləñ-mullañ	mollañ-mollañ	`soft'
d.	cuñəl-cuñal	coñal-coñal	`murmuring'

Hyphen is used to indicate that the ideophones are derived by reduplication of the root morpheme. In what follows our discussion will be confined to vowels of a root morpheme. The examples in (5) show the alternation between the vocalisms [ə-u] and [a-o]. The vocalism of the root morpheme [ə-u] is underlyingly represented as in (6) within the theory of underspecification.

(6)

```
    V     V
    |     |
 [-hi] [+rd]
```

Instead of entering all four features in the underlying representation, the features [-high] and [+round] are sufficient to derive the vowels [ə] and [u]. Other features [+back, -round, -low] for the vowel [ə], and [-back, +high, -low] for [u] are assigned by a set of redundancy rules.

Another type of vocalism commonly found, in addition to {ə,u} and {a,o}, is repetition of an identical vowel, as shown in (7):

(7)

a.	chəllañ-chəllañ	challañ-challañ	`slopping'
b.	səllañ-səllañ	sallañ-sallañ	`gently'
c.	pənc'ək-pənc'ək	panc'ak-panc'ak	`twinkling'
d.	sukun-sukun	sokon-sokon	`noisy'

The vocalism of this class of ideophone is predictable given the melody of the first vowel slot. To capture the native speaker's intuition on the vowel content of this class of ideophone I suggest that the vowels of the root morpheme be represented by simply indicating a vowel slot and leaving the melody plane totally unspecified. The underlying representation of the dark ideophone in (7a), for example, is given in (8).

(8)

```
    V1  (V2)
    |
[-high]
```

The second vowel V_2 is assigned a feature matrix by a phonological rule of spreading.

(9) Spreading

```
    V1 - - (V2)
    |
  [αF]
```

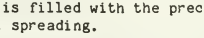
Condition: the rule applies only in ideophones.

I assume that spreading of the specified vowel melody is unbound within the domain.

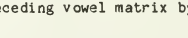
By spreading (9), V_1 in (8) is spelled out as [ə] and so is V_2, since the empty second vowel is filled by spreading the preceding feature matrix [-high] available. Whenever there is an unassociated vowel in the V_2 position, it is filled with the preceding vowel matrix by a phonological rule of vowel spreading.

Thus, the forms k'əñchuñ in (5a) and chəlləñ in (7a) are derived as follows:

(10) a.



b.



The spreading rule (9) is not applicable in (10a), while it applies in (10b) since there is an unassociated vowel slot. A set of redundancy rules apply to spell out the vowels [ə] and [u] for (10a) and two [ə]'s for (10b).

Using the underspecified feature system and representing the identical vowel as an empty slot enables the number of features in the underlying representation to be reduced, and captures the true harmony process in the ideophones in (7).

Although the underlying representation like (8) in combination with the spreading (9) greatly simplifies the grammar, problems arise from the representation (8) due to the emptiness of the V_2. Recall that the vowel [ɨ] is the least marked in Korean and hence, is totally unspecified in the underlying representation system (3). Thus, the nonlinear representation of the vowel [ɨ] is simply (11), which is identical to the representation of V_2 in (8).

(11)

Once the representation (11) is accepted as the vowel [ɨ], it turns out that the ideophone of two identical vowels is represented as if its second vowel were the vowel [ɨ] underlyingly.

The following examples in (12), however, show that leaving unspecified the second vowel of the two identical vowels in an ideophone is not correct.

(12) a.	hənɨl-h nɨl	hanɨl-hanɨl	`sheer'
b.	pusɨl-pusɨl	posɨl-posɨl	`drizzling'
c.	nurɨs-nurɨs	norɨs-norɨs	`yellowish'
d.	mik'ɨl-mik'ɨl	mæk'ɨl-mæk'ɨl	`slippery'

The vocalism of the ideophone in (12a) is represented as follows:

(13) V_1 (V_2)
[-hi]

Note that the representation in (13) is identical to (8). In the representation (13), but not in (8), spreading of the feature [-high] must be blocked to derive the correct vocalism [ə-ɨ]. Application of the spreading (9) to the representation (13) would result in the vocalism *[ə-ə], which is not a correct form for (12a). Therefore, in the presence of both of the two types of vocalism, as shown in the pairs (8) and (13), they must be underlyingly differentiated so that the spreading rule could apply in a distinct way.

In search of a solution to this apparent problem, let's reconsider the representation of the vowel [+] in the nonlinear framework. In discussion of +-deletion phenomenon in Sohn (1986), I argued for the distinction between a vowel linked to an empty feature matrix as in (14a) and the one unassociated with the melody tier as in (14b):

(14) a. x
[ ]

b. (x)

X slot with a vertical line above it is equivalent to a vowel slot V, and the notational variance between x and V to refer to a vowel is trivial in the present discussion. Although both of the representations lead to the vowel [ɨ] in the phonetic representation, they behave differently with respect to the ɨ-deletion: the one in (14a) is not vulnerable to deletion, while the one in (14b) is. I also showed that the epenthetic vowel [ɨ] to break the consonant clusters of the loan word is represented as in (14a), while the vowel ɨ in the native word is represented as in (14b).

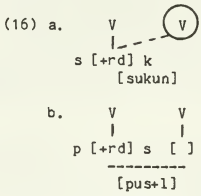
If the vowel [ɨ] in the ideophones is aligned with the epenthetic vowel [ɨ] and is represented as a vowel slot associated with an empty matrix, as in (14a), rather than (14b), then the two representations in (8) and (13) are desirably distinguished. Unfortunately, there is no testing ground to prove the representation of the vowel ɨ in ideophones as in (14a), since the structural description of the ɨ-deletion is not met: there is no ideophone ending with the vowel ɨ, nor is there any suffix that ideophones subcategorize. Nonetheless, the representation of the vowel ɨ in the ideophones as in (14a) will be maintained, insofar as no other evidence argues to the contrary. The representation (14a) is independently motivated in Korean phonology to represent the epenthetic vowel ɨ.

Once the representation (14a) is accepted for ideophones as well as for the epenthetic vowel, the representation in (13) is revised as (15):

(15) V_1 V_2
[-hi] [ ]

Now that the second vowel is associated with a matrix, though empty, spreading of the feature [-high] is by rule blocked in the representation like (15), hence giving the correct vocalism of [ə-ɨ] in the phonetic representation.

Derivations of the phonetic forms sukun in (7d) and pus+l in (12b) are as follows:



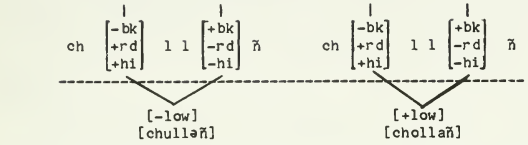
So far, it has been shown that underlying representation based on the underspecification of features reduces the number of features specified in the underlying representation, and that the second vowel which is identical to the first in the ideophone is simply represented by a vowel slot unassociated with a feature matrix. The unassociated vowel slot, though it would be spelled out as the vowel [ɨ] by redundancy rules if nothing happens in the phonology, is subject to the rule of spreading in the vowel harmony domain of ideophones. Thus, underspecification theory provides two different means of filling in an empty slot: one is a set of redundancy rules, and the other phonological rule of feature spreading. In case of Korean ideophones, the unassociated vowel slot is assigned a feature matrix by spreading the preceding vowel melody. Another obvious advantage taken by the representation of the unassociated vowel (14b) is that the harmony process is more sharply captured since exactly the same feature matrix of the first vowel is assigned to the following vowel in this class of ideophones.

3. Vowel Harmony

In discussion of the vowel spreading in the preceding section it is implicitly assumed that the dark ideophone is the base of the word formation process and that the light ideophones are derived from their dark counterparts. We now turn to clarifying these assumptions and accounting for the vowel harmony process of the light ideophones. Unlike the feature spreading rule (9) which accounts for the harmony within an ideophone base, the vowel harmony in the light ideophone involves morphological operation.

In previous accounts of vowel harmony of Korean, both dark and light forms are derived from a neutral form which is neither dark nor light, by associating [±harmony feature], whatever the harmony feature might be: it is the phonological feature [±low] in McCarthy, while in Ahn it is [±L] that indicates relative height.

The dark and light forms are derived as follows in McCarthy's system:



The underlying representations of the light and dark ideophones are a third abstract form, which is represented above the line in (17). The autosegment is identified as a feature-sized morpheme in McCarthy. There are two assumptions behind deriving the light ideophone [chollañ] in (17b): one is that the harmony feature overrides the segmental feature when they are in clash, so that [+low] overrides [+high]. The other is a context-free rule that replaces [+low] with [-low] in round vowels, so that the segment resulting as an output of association is a member of the Korean vowel inventory. The following vowel system is underlyingly posited for Korean in McCarthy's account:

(18)

i	ʊ̈	+	u	
e		ə		
æ	ʊ̈	a	o	

As a result of the vowel system like (18), the harmony phenomenon is neatly explained with the harmonizing feature [-low]. The two vowels /ʊ̈/ and /o/ are underlyingly posited in an abstract way, so that they could harmonize with the unround low vowels /æ/ and /a/ respectively. At the cost of making possible a perfectly symmetrical vowel harmony, however, the system in (18) necessitates a context-free rule throughout the entire phonology. Moreover, the abstract postulation of these two underlying phonemes is not motivated elsewhere in the Korean phonology. Insofar as the present study provides an equally compatible account of the harmony process, it is preferred over the one that is crucially dependent upon the absolute neutralization of the two underlying segments.

Basically the same account is provided in Ahn's system: by replacing the morphophonological feature [±low] with a diacritic feature [±L] which indicates a relative height, he dispenses with a context-free rule. However, the feature [±L] is no more than a phonological use of a diacritic feature since a context-free rule is eliminated at the cost of using a phonologically unmotivated feature [±L]. There is no morphological motivation, either.

Based on the underspecified feature system and the nonconcatenative morphological theory, the present study is able to provide a more restricted account of the vowel harmony. From the phonological point of view, the harmonizing feature is roughly either [+low] or [-low] to represent the dividing line in (1). Resorting to the underspecified system

(3), the feature value of the feature [low] in the underlying representation is restricted to `+' only, and hence the value `-' for the feature [low] is not available in the underlying representation of any lexical item. That is to say, so far as the nonconcatenative morphology allows a feature-sized morpheme using the feature [low], only [+low], but not [-low], is eligible for entering the lexicon as a morpheme.

Provided that only [+low] is identified as a feature-sized morpheme which carries the semantic representation of light motion of ideophones, word formation process is restricted to the derivation of the light ideophone, but not of the dark ideophone. As a consequence, only the dark ideophone is listed in the lexicon and forms the base of the derivation of the light ideophone. Thus, this proposal is preferred over the analysis which postulates two separate derivations of dark and light ideophones from a third neutral form.

To illustrate the way lexicon is organized with respect to ideophones,

(19) a. [+low]: lightness of ideophone
subcategorization: [ ]$_X$
|
where $\overline{X}$ is an ideophone.

b. Root ideophone: Dark
|
[+low] ===> Light Ideophone

(19a) specifically says that the phonological representation [+low] is a feature-sized morpheme that carries the semantic representation of lightness in ideophones, and that it has a subcategorization frame that requires nonconcatenative association to the root morpheme. The subcategorization frame characterizes the nonlinear concatenation of feature-sized morpheme, as opposed to prefix-, infix-, or suffix-ation. By the word formation process (19b) dark ideophone feeds the input to the derivation of the light counterpart, in conjunction with the light morpheme [+low].

Before we move on to the derivation of the light ideophone from its dark counterpart, a discussion of the directionality of derivation is in order: light ideophone is derived from the dark base, but not vice versa. The first argument stems from the fact that the theory forces us to posit [+low], but not [-low], to be a possible morpheme in the lexicon. The theory of underspecification and the epenthetic vowel in Korean lead us to posit [+low] as the markedness value. From this certain predictions follow: first, if there is a feature-sized morpheme involving [low], the value must be "+". According to the representation based on underspecification, the feature [-low] is not available until late in the phonology. Thus, the phonological representation [-low] as a morpheme, which would carry the semantic representation of darkness, cannot enter the lexicon. Therefore, it must be the light morpheme [+low] that is listed in the lexicon. Secondly, if there is such a morpheme, then it is predicted that no ideophone is specified with the feature [+low] in the underlying representation, and this prediction is empirically borne out: the light

ideophones show up in their underlying form only, without the feature [+low], and they attain this feature as a result of the morphological process of nonconcatenating the affix [+low].

Another argument for the directionality of the ideophone derivation is based on the morphological aspect. As pointed out in Kim-Renaud (1976) as well, there are dark ideophones that do not have light counterparts, but there are no light ideophones that do not have dark counterparts.[2]

(20) a.	ulkəñ-ulkəñ	*olkañ-olkañ	`chewing'
b.	pinduñ-pinduñ	*pændoñ-pænduñ	`idling'
c.	ǂsisi	*asisi	`chilly'
d.	təñsil-təñsil	*tañsil-tañsil	`merrily (dancing)'

Those ideophones in (20) which do not have their corresponding light counterpart, are marked in the lexicon with a marking condition *[Word Formation Rule (19b)], so that these bases do not feed the input to the ideophone derivation. The asymmetry between dark and light ideophones shown in (20) suggests that the light ideophones are derived from their dark counterparts, rather than the other way around.

It has been argued on both phonological and morphological grounds that the light ideophones are derived from the corresponding dark ideophones. We now turn to the derivation of the light ideophone.

Once the word formation rule (19b) is carried out, it is phonology that is concerned with its output. The Universal Association Convention (UAC) of the autosegmental phonology provides mechanisms for docking the feature-sized morpheme [+low] in the leftmost vowel.

(21) Universal Association Convention (Archangeli 1985)

Map a sequence of melody onto a sequence of anchors.
a. one-to-one
b. left-to-right

It is assumed that vowel melody plane is separately represented from the consonantal plane (Archangeli 1984), and hence the autosegment for vowel harmony is always associated with the leftmost vowel of the base by this convention.

The morphophonological feature [+low] associated by the UAC (21) spreads to the right and results in multiple associations, hence functioning as a harmony feature.

(22) Harmony Spreading

, where [+low] is a morphophoneme.

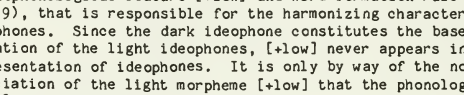
Harmony spreading (22), however, is to be distinguished from the feature spreading (9) in terms of both the feature content and the mode of

spreading: in case of the harmony spreading (22), only the morphophonological feature [+low] spreads to the following vowels as far as they belong to the base of the ideophone. In case of the feature spreading (9), however, any feature may spread insofar as the following vowels are unlinked to the melody plane.

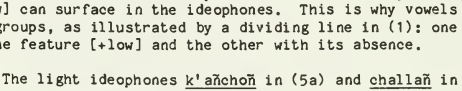
It is the harmony spreading (22), in conjunction with the morphophonological feature [+low] and word formation rule in the lexicon as in (19), that is responsible for the harmonizing characteristics of Korean ideophones. Since the dark ideophone constitutes the base of the word formation of the light ideophones, [+low] never appears in the lexical representation of ideophones. It is only by way of the nonconcatenative association of the light morpheme [+low] that the phonological feature [+low] can surface in the ideophones. This is why vowels harmonize into two groups, as illustrated by a dividing line in (1): one with the presence of the feature [+low] and the other with its absence.

The light ideophones k'añchoñ in (5a) and challañ in (7a), for example, are derived as follows:

(23) a.



b.



In (23a) the morphophonological autosegment [+low] is associated with the leftmost vowel by the UAC (21) and spreads to the following vowel slot by the harmony spreading (22). As for the second vowel in (23a), however, the feature matrix [+round, +low], resulting from the nonlinear concatenation of the feature-sized morpheme to the base, is further assigned features [-high, -back] by redundancy rules, and spells out a segment [ɔ], which is not present in the vowel inventory of Korean. Since the resulting segment is not a possible sound of Korean, it is adjusted by raising in the phonetics, as formulated in (24):

(24) Phonetic Implementation

$$[+low] \dashrightarrow [-low] \;/\; \begin{bmatrix} +round \\ ------ \end{bmatrix}$$

Due to the phonetic implementation of raising the low round vowel, it is always the vowel [o] that appears in the light ideophone if the vowel is specified with [+round], as shown in the examples in (5) and (7).

Phonetic implementation rule (24), however, differs from context-free rule in McCarthy's system. In McCarthy, the vowel system of Korean is underlyingly posited in an abstract way, as shown in (18). As a consequence, the grammar requires an absolute neutralization of [ɔ] to [o] throughout the entire phonological component, not simply in the lower phonetic component.

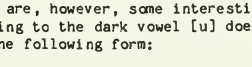
There are, however, some interesting cases where the light vowel corresponding to the dark vowel [u] does not surface as [o], as expected. Consider the following form:

(25) pusiləkʼ posilak ~ pasilak `rustling'

The dark ideophone has two alternating light counterparts according to whether the dark vowel [u] changes into [o] or [a] in its light form.

Application of the UAC (21) and harmony spreading (22) gives the representation in (26):

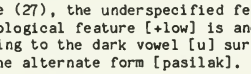
(26)



The feature matrix for the first vowel [+round, +low] is further assigned features [-high, -back] by redundancy rules, and the feature [+low] changes into [-low] by the phonetic implementation (24), hence deriving the vowel [o]. We will return to the absence of the feature [+low] for the second vowel of the light ideophone [posilak] (*[pos lak]) in discussion of the neutral vowel.

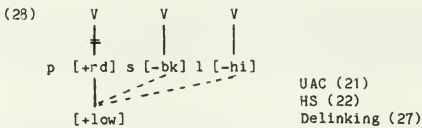
The problematic case is when the light counterpart of the dark vowel [u] is realized as [a] instead of [o], as in the form [pasilak]. That is, the feature [+round] is deleted from the impossible feature matrix [+round, +low] and the default value [-round] is assigned instead. Deletion of the feature [+round] must take place in the phonology since it has to apply before the redundancy rule filling in [-round].

(27) Delinking



By the rule (27), the underspecified feature [+round] is delinked when the morphophonological feature [+low] is anchored in it. Thus, the light vowel corresponding to the dark vowel [u] surfaces as [a] rather than [o], deriving the alternate form [pasilak].

(28)



The alternation between [posilak] and [pasilak] in the corresponding light forms of the dark ideophone [pusilək] is thus accounted for in terms of at which point in the grammar this impossible segment is taken care of: if the clash among the features is avoided in the lexical phonology, the light vowel [a] results, whereas the vowel surfaces as [o] if the clash is not filtered out until the phonetics. This option varies from speaker to speaker, and from time to time even for a single speaker. From this perspective, delinking (27) is an optional rule.

So far, we have examined the alternating light ideophones derived from a single base, and have shown that there are two ways of preventing generation of an impossible segment in the phonetic representation: one in the phonetic component, and the other earlier in the phonological component. Since these two rules apply in the different components of the grammar, their effects are disjunctive. In the unmarked case, the light ideophone is derived resorting to the phonetic implementation (24).

Consider the following ideophone pairs:

(29) a.	put̚l	pot̚l *pat̚l	`soft'
b.	put̚l	pat̚l *pot̚l	`trembling'
c.	mullən̆	mollaŋ̆ *mallŋ̆	`softy'
d.	mullən̆	mallaŋ̆ *mollaŋ̆	`flabby, flaccid'

The base put̚l, unlike in the example in (25), has two non-alternating light counterparts. The dark vowel [u] becomes [o] in the light ideophone (29a), while it becomes [a] in (29b). The two ideophone pairs in (29c,d) parallel those in (29a,b). When the resulting impossible feature matrix [+round, +low, +back, -high] is adjusted to the sound inventory of Korean by the phonetic implementation (24), it is spelled out as [o] as in (29a,c). On the other hand, when it is governed by the delinking rule (27), it surfaces as [a] as in (29b,d).

The two light ideophones in (29a,b), however, are not alternating, since they are distinguished with respect to their semantic representation, though sharing a single underlying representation. Therefore, each lexical entry must be specified with phonologically relevant strategy in deriving the light counterpart. For example, the base put̚l is listed in the lexicon as follows:

(30) a. [put̚l]: `soft'

b. [put̚l]: `trembling'
[+Delinking (27)]

In the lexical representation in (30a), it is not specified in the lexicon

that the phonetic implementation (24) is at work, since it goes by default in the phonetics. As a contrast, the lexical representation (30b) is entered with a specification that the morphophonological feature takes precedence over the already specified feature, if in conflict.

To summarize, it has been argued on the morphophonological ground that the harmony feature of Korean is [+low], but not [-low], and that the harmony process is based on the nonconcatenation of this feature-sized morpheme. Thus, the so-called harmonic bifurcation of dark and light vowels is accounted for by the dominant harmony feature [+low]. It has also been shown that in the synchronic grammar the impossible segment resulting from the association of the autosegmental harmony feature [+low] is adjusted by the phonetic implementation in unmarked case, though there are other ways of rectifying it if marked in the lexicon to that effect. Thus, the account proposed in the present study is preferred over McCarthy's in that there is no abstract solution, and over Ahn's in that there is no phonologically or morphologically unmotivated diacritic features involved.

We now turn to the property of neutral vowels in the harmony process of Korean.

4. Neutral Vowels

It is well observed in the literature of vowel harmony (Clements 1976, Halle and Vergnaud 1980, Vago 1985) that there are vowels which block the spreading of the harmonizing feature. In some cases, this vowel simply blocks the harmony process, allowing the harmony to pass right over it. In some others, it not only blocks the harmony process, but prevents harmony from propagating past over it. Furthermore, it sometimes triggers its own harmony domain as well. The former is called neutral vowel and the latter opaque vowel.

Consider the following ideophones of Korean:

(31) a.	kilc'uk-kilc'uk	kælc'ok-kæ'c'ok	`tall, long'
b.	k'icək-k'icək	k'æcak-k'æcak	`scribbling'
c.	pisil-pisil	pæsil-pæsil	`staggering'
(32) a.	k̟lkcək-k̟lkcək	kalkcak-kalkcak	`scratching'
b.	s̟lc'ək	salc'ak	`stealthy'
c.	h̟nt̟l-h̟nt̟l	hant̟l-hant̟l	`rocking'

The vowels [i] and [̟] in the first syllable of the dark ideophones above do turn into [æ] and [a] respectively in their corresponding light forms.

Compare the ideophones in (31) and (32) with those in (33) and (34).

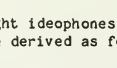
(33) a.	pəñsil-pəñsil	pañsil-pañsil	`smiling'
b.	pusisi	posisi	`gently rising'
c.	pəncil-pəncil	pancil-pancil	`shining'

(34) a. siñk+l-siñk+l sæñk+l-sæñk+l `smiling'
b. pus+l-pus+l pos+l-pos+l `drizzling'
c. s+lk+m-s+lk+m salk+m-salk+m `stealthy'

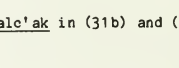
The vowels [i] and [+] in the non-initial syllables of the dark ideophones above do not change into [æ] and [a] in their corresponding light ideophones.

The light ideophones k'æcak and salc'ak in (31b) and (32b), for example, are derived as follows:

(35) a.



b.

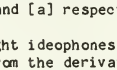


[k'æcak] [salc'ak]

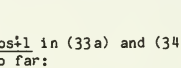
The vowels [i] and [+] on the first syllable of the base undergo association of the morphophonological feature [+low], resulting in the vowels [æ] and [a] respectively.

The light ideophones pancil and pos+l in (33a) and (34b), however, are different from the derivations shown so far:

(36) a.*



b.*



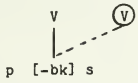
Spreading of the feature [+low] to the following vowel slot results in wrong forms *pancæl and *posal. Since the vowels [i] and [+] are intact by the harmony process in the non-initial syllable, harmony spreading (22) must be blocked in this environment.

Vowels [i] and [+] are not subject to the spreading of the harmony feature [+low] in the non-initial syllable, hence remaining as [i] and [+], rather than [æ] and [a], respectively in their light counterparts. Therefore, they must be neutral vowels behaving like consonants invisible to the harmony process. Vowels [i] and [+], albeit blocking the spreading of the harmony feature [+low], are not opaque since they do not trigger their own harmony to the next vowel to the right: the dark vowel /ə/ preceded by the neutral vowel [i] in pusiləkin (25) changes into [a] in its light counterpart.

Consider now the ideophonic pairs in (31a) and (32a), where the two vowels in the base are identical and neutral with respect to the harmony

process. The base ideophones pisil and h+nt+l in (31c) and (32c) respectively result in a geminate structure by spreading (9), as shown below:

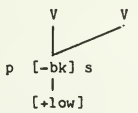
(37) a.



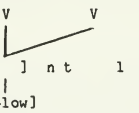
b.

Thus, the nonconcatenative association of the morphophonological feature [+low] as in (38) automatically assigns the feature [+low] to both of the slots under the geminate structure.

(38) a.



b.

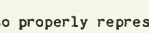


Since the second vowel does not carry its own feature matrix, there is no mechanism to skip the spreading of the harmony feature [+low] to the second vowel only, excluding the first one. As a result, the neutrality of the vowels [i] and [ɨ] in the non-initial position cannot be represented with regard to the harmony process.

Thus, another mechanism is necessary to properly represent the neutral vowels in the harmony process. Here, we invoke Tier Conflation (McCarthy 1986) to the effect that the consonantal and vowel planes are conflated after the application of the spreading (9). As a result of tier conflation, the feature matrix doubly linked to the two vowels copies itself in order for the two vowels to be singly linked to the feature matrix. Otherwise, the association lines of the geminate structure would violate the well-formedness condition on association (Goldsmith 1976, Pulleyblank 1983), since the consonantal and vowel planes are intertwined in the proper linear sequence after tier conflation, as represented below:

(39) a.

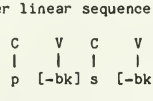
b.



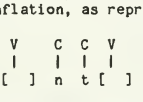
Tier conflation in nonlinear representation gives the same effect as the bracket erasure convention in lexical phonology in that it conditions applicability of phonological rules.

With the geminate structure degeminated by tier conflation, the morphophoneme [+low] is added to form the light counterpart.

(40) a.



b.



By the UAC (21) the morphophonological feature [+low] is associated to the leftmost vowel. Spreading of the feature [+low] to the right, however, is blocked due to the presence of the neutral vowels in the non-initial position. Thus, the correct forms pæsil and hant+l are derived corresponding to the dark ideophones pisil and h+nt+l in (31c) and (32c) respectively.

In this section, we have examined the vowel harmony process of Korean with respect to the neutral vowels i and +. Geminate structure involving neutral vowels provides crucial evidence for tier conflation, since otherwise blocking effect on spreading the harmony feature [+low] cannot be expressed in the geminate structure.

5. Vowel Harmony in Verbal Morphology

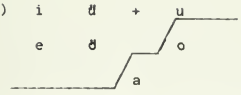
A process similar to the vowel harmony of ideophones is observed between verbal stem and the immediately following ə-initial suffixes such as ə `infinitive' and əs' `past tense marker'. Historically, this part of verbal morphology is recognized as undergoing the same vowel harmony process as the ideophones. In the synchronic grammar, however, vowel harmony process is in general confined to the ideophones. I will show on both phonological and morphological grounds that the behavior of the suffix-initial vowel /ə/ in the verbal morphology is distinguished from the harmony in the ideophones.

Phonologically, the alternation of the suffixal vowel /ə/ does not follow the dichotomy of dark and light vowels postulated in the harmony system of ideophones, as shown in (41):

(41)	a. s'ip-ə	`to chew'
	b. t'e-ə	`to separate'
	c. khæ-ə	`to mine'
	d. k'+nh-ə	`to cut'
	e. mək-ə	`to eat'
	f. cuk-ə	`to die'
	g. sok-a	`to be deceived'
	h. kam-a	`to wind'

The infinitive suffix alternates between [ə] and [a] according to the stem-final vowel: the infinitive suffix surfaces as [a] only after the stem-final vowels /o/ and /a/, as in (41g,h). Otherwise, it appears as [ə], as in (41a-f). The crucial difference in the vowel harmony processes of ideophones and verbal morphology lies in the behavior of the front low vowel [æ]. The vowel [æ] belongs to light vowel harmonizing with [a] in ideophone, whereas it behaves as a dark vowel harmonizing with [ə] in verbal morphology, as shown in (41c). Thus, unlike the harmony system of ideophone as illustrated in (1), the alternation of the vowels in the verbal morphology is illustrated as follows:

(42)



Historically, the verbal morphology shows the same harmony process as ideophones since there is no empty cell in the back round vowels in the historical grammar[11] and the suffix /ə/ alternates with [a] after both front and back low vowels. It is, however, no more tenable in the synchronic grammar of Korean since dark and light distinction is available only in the back vowels, as shown in the diagram (42). Thus, it follows that the alternation of the suffix vowel in the verbal morphology must be distinguished from the vowel harmony process of the ideophones.

From the morphological point of view, the feature [+low] in ideophones is motivated as a feature-sized morpheme on the ground of nonconcatenative morphological theory. As a consequence, it is autosegmentally represented on a separate tier and spreads to the following feature matrices, hence resulting in a vowel harmony system. In case of verbal morphology, however, there is no motivation to treat the feature [+low], if any, as a harmony morpheme. It is the immediately preceding stem-final vowel that conditions the alternation of the suffix vowel /ə/. That is, the stem-final and suffix-initial vowels are in a master-slave relation since the one affects the other. Recall that the vowels of the base ideophones are all equal in that none of them determines the feature matrix of the other. Therefore, the two vowel phenomena, though seemingly a single phonological process, must be identified as different processes: ideophones reveal true vowel harmony process, while verbal morphology simply involves segmental alternation conditioned by a preceding vowel.

Before we move on to the account of the alternation of the suffix-initial vowel between [ə] and [a], the underlying representation of the suffix needs to be settled. If the suffix is underlyingly /ə/, then it alternates with [a] after the vowels /a/ and /o/. On the other hand, if the suffix is underlyingly represented as /a/, then it alternates with [ə] after the rest of the Korean vowels. None of the two environments, however, makes a natural class of segments. On the simplicity ground, the present study takes /ə/ as the underlying representation of the infinitive suffix, since otherwise there is no phonological explanation for the alternation of /a/ to [ə] after all the front vowels as well as some back vowels.

Crucial to the account of the alternation are the vowel pairs between stem and suffix: [æ-ə] as in (41c), [ə-ə] in (41e), [o-a] in (41g), and [a-a] in (41h). The underlying representations of these pairs in terms of underspecification of features are as follows:

(43)

	Stem	Suffix
a. [æ-ə]:	V	V
		|
	[-bk, +lo]	[-hi]

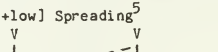
b. [ə-ə]:

c. [o-a]:

d. [a-a]:

In (43a,b) the suffix vowel remains unchanged. In (43c) the feature matrix [-high] for the suffix needs to be assigned [+low] by some means. In (43d) the feature matrix [+low] for the stem vowel spreads to the suffix vowel to derive [a]. It is a common phenomenon in phonology that a vowel assimilates the following or preceding vowel regardless of the number of intervening consonants, and this motivates to write the assimilatory process as spreading (Archangeli 1985, Hayes 1986):

(44) [+low] Spreading[5]

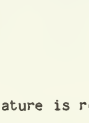


, where X is verbal stem.

By the [+low] spreading rule (44), the feature [+low] of the last stem vowel spreads to the immediately following suffix vowel /ə/. Thus, the vocalism in (43d) is accounted for straightforwardly, and so is the one in (43b). Since there is no feature [+low] in the stem vowel in (43b), spreading does not apply, giving the correct vocalism.

Problems, however, arise in accounting for the suffix vowels in (43a,c). First, the non-application of [+low] spreading (44) in (43a) is due to the organization of feature tiers in the vowel melody plane[6], as in (45).

(45) Organization of tiers in the vowel melody plane

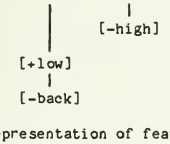


It is assumed that each feature is represented on a separate tier, and that

a collective plane including all these feature tiers forms the vowel melody.

To illustrate the featural representation of the two vowels in (43a) in detail,

(46)

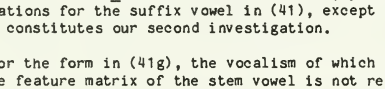


In the representation of features like (46), spreading of the feature [+low] to the suffix vowel automatically involves spreading of the feature [-back] as well. Due to the free ride spreading of [-back], the feature [+low] of the vowel matrix [+low, -back] is prevented from spreading to the following suffix vowel. This is why the vowel [æ] in the verbal morphology aligns with [ə]. Note, however, that the harmony spreading of the feature [+low] in the ideophones is not subject to this restriction, since it is a morphophonological feature and hence is represented on a separate morphemic tier.

In the present analysis, the alternation of the suffix vowel in the verbal morphology is accounted for by spreading of a phonological feature [+low], as opposed to that of a morphophonological feature in the ideophones. This account, in conjunction with the underlying representation of the ə-initial suffixes as /ə/, provides correct phonetic representations for the suffix vowel in (41), except in (41g). This exception constitutes our second investigation.

As for the form in (41g), the vocalism of which is represented in (43c), the feature matrix of the stem vowel is not represented with a harmony feature [+low], but the suffix vowel is somehow assigned [+low], surfacing as [a]. Intuitively, the alternation involved in (41g) parallels the harmony process of the ideophone, namely, that the light stem vowel harmonizes with the light suffix vowel. As pointed out earlier in the discussion, however, there is neither phonological nor morphological source in (43c) that introduces the feature [+low] to be spread to the suffix. Thus, the [+low] spreading rule (44) cannot apply to derive the suffix [a]. Therefore, I argue that the so-called harmony between the stem vowel [o] and the suffix vowel [a] must be accounted for by a rule that inserts the feature [+low] on the following suffix.

(47) [+low] Insertion



, where X is verbal stem.

By [+low] insertion (47), [soka] in (41g) is derived from /sok-ə/.

The so-called vowel harmony in the verbal morphology is thus captured by the two different rules of [+low] spreading (44) and [+low] insertion (47). Of course, it is accounted for by a single process of spreading (44) in the historical grammar since the vowel /o/ is regarded as a low round vowel. However, resorting to the historical grammar results in a totally abstract solution. Under a system in which the vowel /o/ is underlyingly represented as a low round vowel as in McCarthy, spreading of [+low] to the suffix vowel takes care of the alternation of /ə/ to [a] after the stem vowel /o/, as it does after the stem vowel /a/. This account, however, has been argued against since it requires an absolute neutralization in the grammar. Furthermore, the abstract vowel system still needs a stipulation to prevent the front low vowel /æ/ from participating in the vowel harmony of the verbal morphology. Therefore, the alternation of the suffix vowel /ə/ into [a] after the stem vowel /o/ must be accounted for in terms of a separate rule of [+low] insertion (47), as distinguished from harmony spreading (22) on the one hand and from [+low] spreading (44) on the other.

The present analysis in which the suffixal alternation of the verbal morphology is explained by the two phonological processes is further supported by the fact that different scales of acceptability are recognized when the applications of the two rules are violated.[7]

Consider first the following commanding verbal forms:

(48)	a. cha	cha-la *cha-ə-la	`to kick'
	b. po	po-a-la *po-ə-la	`to see'

There is a vowel contraction occurring between the stem-final and the suffix-initial identical vowels in (48a). When the verbal stem ends with a vowel /a/ or /o/, the following suffix vowel /ə/ must alternate into [a]. Thus, non-application of [+low] spreading (44) as in (48a) or that of [+low] insertion (47) as in (48b) results in totally unacceptable forms.

The non-application of these two rules, however, results in as acceptable a form as the application of these two rules, when the verbal stem ends with more than two consonants, as shown in (49) and (50):

(49)	a. salm	salm-a-la ~ salm-ə-la	`to boil'
	b. c'alp	c'alp-a-la ~ c'alp-ə-la	`to be short'
	c. palp	palp-a-la ~ palp-ə-la	`to step on'
	d. halth	halth-a-la ~ halth-ə-la	`to lick'
(50)	a. kolm	kolm-a-la ~ kolm-ə-la	`to be stale'
	b. olm	olm-a-la ~ olm-ə-la	`to be infected'

The two consonants intervening between the stem vowel and the suffix vowel of the verbal forms in (49) and (50), whether the stem vowel is /a/ or /o/, may interrupt the two rules of spreading and insertion.

Unlike the peripheral cases in (48) to (50), in which the two rules of [+low] spreading (44) and [+low] insertion (47) share a single scale of acceptability upon their non-application, these two rules indicate different degrees of acceptability when there is a single consonant

intervening between the stem-final and suffix-initial vowels. In what follows, four types of notation are used to indicate the hierarchy of acceptability: "*", "*?", "??", and "?" range from "*" as "unacceptable" to "?" as "somewhat acceptable", and the degree of acceptability improves rightward along the scale. Absence of any notation indicates "acceptable".

(51)	a. coh	co-a-la	*	co-ə-la	`to be fond of'
	b. noh	no-a-la	*	no-ə-la	`to put'
(52)	a. nah	na-a-la	*?	na-ə-la	`to produce'
	b. t'ah	t'a-a-la	*?	t'a-ə-la	`to brait (of hair)'
	c. s'ah	s'a-a-la	*?	s'a-ə-la	`to accumulate'
	d. p'ah	p'a-a-la	*?	p'a-ə-la	`to granulate'

The stem-final consonant /h/ above is deleted before the vowel-initial suffix. Non-application of the [+low] insertion (47), when the stem vowel is /o/ as in (51), is totally unacceptable. To the contrast, non-application of the [+low] spreading (44), when the stem vowel is /a/ as in (52), is more acceptable than in the former.

Compare also the forms in (53) where the stem vowel is /o/ with those in (54) where it is /a/:

(53)	a. sok	sok-a-la	??	sok-ə-la	`to deceive'
	b. nok	nok-a-la	??	nok-ə-la	`to melt'
	c. pok'	pok'-a-la	??	pok'-ə-la	`to roast'
	d. tot	tot-a-la	??	tot-ə-la	`to rise'
	e. nol	nol-a-la	??	nol-ə-la	`to play'
	f. mol	mol-a-la	??	mol-ə-la	`to drive'
(54)	a. cak	cak-a-la	?	cak-ə-la	`to be small'
	b. k'ak'	k'ak'-a-la	?	k'ak'-ə-la	`to cut'
	c. al	al-a-la	?	al-ə-la	`to know'
	d. chac	chac-a-la	?	chac-ə-la	`to find'
	e. kam	kam-a-la	?	kam-ə-la	`to wind'
	f. cap	cap-a-la	?	cap-ə-la	`to catch'

Non-application of the [+low] insertion (47) in the verbal forms in (53) is much worse than that of the [+low] spreading (44) in the forms in (54).

The observations made by the data in (48) through (54) are as follows: there is a scale of acceptability with respect to the non-application of the spreading (44) and insertion (47) in the verbal morphology, although there is no such acceptability hierarchy in the non-application of the harmony spreading rule (22). The verbal forms in (51) to (54) also indicate that [+low] insertion (47) applies more obligatorily than [+low] spreading (44). Finally the fact that the forms in (51) to (52) are worse than those in (53) to (54) indicates that the application of these rules are more strictly observed when there is no consonant intervening between the stem-final and suffix-initial vowels.

The observations on acceptability hierarchy lead to some interesting conclusions: first, the two discrepant degrees of acceptability with respect to the [+low] spreading (44) and [+low] insertion (47) indicate

that the suffix alternation in the verbal morphology is accounted for by the two different processes, but not by a single process. Secondly, the fact that the degree of the acceptability upon the non-application of these two rules is affected by the number of the consonants intervening between the controller and controlled vowels, reveals that these two rules apply at the different point of the phonological derivation from the harmony spreading rule (22) in the ideophones. These two points further support the argument that the seemingly similar processes involved in the vowel harmony of ideophones and the verbal morphology are in fact different phonological processes in the synchronic grammar of Korean.

6. Conclusion

Integration of the nonconcatenative morphology and the theory of underspecification forces to postulate the harmony feature as [+low] but not as [-low], and enables to economize both phonological and morphological derivations. The nonconcatenative morphology lays out the theoretical basis to enter a feature-sized morpheme in the lexicon. As for this feature, the theory of underspecification is capable of making a prediction on its feature value, and this prediction is borne out throughout the analysis.

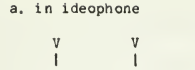
The analysis proposed in the present study has some advantages over the previous accounts. First, the present account overcomes the difficulty arising from the semantically motivated phonological features [±dark] and [±light] in Kim-Renaud (1976), namely, the misconception of the relation between semantic and phonological features.[8] Following the organization of the grammatical components of the standard theory (Chomsky 1965), semantic features [dark] and [light] have nothing to do with their manifestation of the phonological features as [±low]. Within an integrated theory of morphophonology, however, identifying [+low] as a feature-sized morpheme makes it possible for the feature to result in a dark and light harmonic dichotomy by way of nonconcatenative association. Secondly, the present analysis does not complicate the grammar by positing an abstract underlying vowel system, and hence leading to an otherwise unmotivated context-free rule throughout the entire grammar, as in McCarthy. The present analysis also dispenses with a diacritic feature [±L] in Ahn, which is neither phonologically nor morphologically motivated.

The present analysis accounts for the different harmony diagrams for ideophones (1) and the verbal morphology (42): in the former the harmony feature is morphologically motivated and spreads, hence causing the vowel [æ] to harmonize with [a]. In the latter, however, the feature [+low] of the vowel [æ] is neither morphologically motivated nor is it phonologically free to spread due to its constellation on the melody plane, hence failing to align with [a]:

(55) a. in ideophone

UAC (21) & HS (22)
Phonetic Rep.

b. in verbal morphology



[+low] spreading (44) n.a.
Phonetic Rep.

Thus, it follows naturally from the different characteristics of the feature [+low] that the so-called vowel harmony of the verbal morphology is distinguished from the one in the ideophones.

NOTES

* This paper has benefited greatly from discussions with Michael Kenstowicz and comments from Diana Archangeli. I am also grateful to Chin-W. Kim for the helpful suggestions in relation to the notes 7 and 8. Any faults are of course mine.

[1] The idea that the features, if predictable, are left blank in the feature matrix and that they are filled in by redundancy rules later in the phonological derivation, is not a brand-new proposal. It has been floating around in the form of the so-called morpheme structure rules or condition (Stanley 1967, Chomsky and Halle 1968, Kean 1975).

[2] There are a few light ideophones whose corresponding dark forms are not acceptable:

a.	kallæ-kallæ	*kəlle-kəlle	`dividing into forks'
b.	kalki-kalki	*kəlki-kəlki	`shredding into pieces'
c.	karak-karak	*kərək-kərək	`in sticks'

These, however, do not constitute true counter-examples, since the root morphemes kallæ and karak are listed as noun stem in the lexicon, and the ideophones are derived by reduplication of the noun stem, but not by the word formation process (19b) of nonconcatenation of an autosegment to the base.

[3] In addition to the two major rules of dealing with the impossible segments, another process is in need to account for the problematic case like (a).

(a) silc'uk sælc'ok ~ sælc'uk `being reserved'

In the alternative light ideophone [sælc'uk], the second vowel of the base [u] alternates with neither [o] nor [a]. In order to account for this case a third phonological rule to the effect of delinking the harmonizing feature [+low] must apply at some point in the phonology before the phonetic component.

[4] The vowel system of Korean in the historical grammar is reconstructed with no empty cell in the low round vowel position in C.-W. Kim (1976). Thus, the horizontal line that characterizes the vowel harmony system of Korean in terms of [-low] is transformed into the diagonal line after the vowel shift.

[5] I assume here that either the intervening consonant is invisible to this rule, or the rule applies before tier conflation at which point no consonant matters in spreading the vowel melody. Thus, the [+low] spreading (44) may apply without violating the universal association convention even when the verbal stem ends with a consonant, which intervenes between the stem-final and the suffix-initial vowels.

[6] In Archangeli's (1985) term, a multitiered planar is assumed, contrary to her argument for coplanar representation. However, coplanar representation, if [+low] and [-back] are represented on a single melody tier, is equally compatible insofar as non-application of rule (44) in (43a) is concerned. The assumption herein is nontrivial, and further investigations on nonlinear representation of features are in order (see also Sohn 1985b).

[7] The testing ground is first suggested by Professor C.-W. Kim in his class lecture to argue that a single harmony process is not capable of accounting for the vowel alternations in the ideophones and the verbal morphology.

[8] This criticism is originally due to Professor C.-W. Kim in his class lecture.

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ON THE RELATIONSHIP BETWEEN THE EARLY PAEKCHE LANGUAGE AND THE KARA LANGUAGE IN KOREA*

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An examination of the Early Paekche language which was spoken on the central region of the Korean peninsula in the ancient period (Toh 1977; 1979/80; 1982; 1984b) and the Kara language which was spoken in the southern region in the contemporary period as could be gleaned primarily from the place names recorded in the old texts reveals that they show both similarities and differences such that similarities appear to be central in character while the differences smack of southern elements. This makes it difficult to pinpoint the origin of the Kara language. However, if the similarities are mainly due to language contact, then it may be said that its genetic affinity may be with the southern Han branch.

1. Language in the central region of the Korean peninsula

The language situation in the central region of the Korean peninsula in ancient times appears to be a complex one, for the occupation of the region changed hands several times during seven centuries. As Figure 1 shows, Paekche was founded in this region and ruled for five centuries (18 B.C. - 475 A.D.), then during the next century it was invaded by Koguryŏ, after a century of which it finally became the territory of Silla. It is easy to imagine that the language must have undergone some violent changes, although it is not necessarily the case that just because the owner of the land changed hands from the Nation A to B then to C, the language also changed from the language of A to that of B then to that of C. If we take A to be the language of Paekche, B the language of Koguryŏ, and C the language of Silla, then it can be said that A, the indigenous language, must have taken B and C either as a superstratum or a substratum.

Despite this kind of complex language situation in the central region of the peninsula in the ancient period, there has been a total neglect in the subject during the past seventy years. Most scholars simply assumed that the language of the region was that of Koguryŏ. This assumption was based on a statement in Kim Pu-shik's Samkuk-saki (Chronicles of Three Kingdoms) that the place names of the region are those of Koguryŏ. Only in recent years this assumption has been questioned. Toh (1977) opened the debate by arguing that, since

Paekche was founded here and ruled the region for five centuries, the indiginous language must be assumed to be that of Paekche. Toh (1980) reiterated his argument by declaring that the language of the region is the Early Paekche language. Kim Pang-han (1981a,b) also argued that the central language of the period was not the Koguryo language but was the "native" language of the Hans. Toh (1982) strengthened his earlier argument. The following figure is taken from Toh (1982) and repeated here.

Figure 1. The Korean peninsula during the Three Kingdom period
Region A(a+b): Early and middle period of Paekche (18 B.C. - 475 A.D.)
Region A + B: Koguryŏ's occupied territory (476 - 553 A.D.)
Region Bb: Silla's occupied territory (553 - 668 A.D.)
Region C: Mahan territory before Paekche's occupation (before 346 A.D.), then Paekche's territory until 660 A.D.
Region Dc: Silla territory (57 B.C. - 935 A.D.)
Region Dd: Kara territory (42 - 532 or 562 A.D.), then Silla's occupied territory
Region D: Koguryŏ's original territory (37 B.C. - 668 A.D.)

The purpose of this paper is to discuss the relationship between the language of Region A (the Early Paekche) and that of Region Dd (Kara). In the course of discussion, the relationship between the language of A and that of B (Yemaek?) and between the latter and the language of Dc (Silla) will be also touched upon.

2. The history and language of Kara

Kim Pu-shik, the author of the Chronicles of Three Kingdoms (1145) totally neglected the contemporary Kara nation. He was faithful in recording the history of Silla, Koguryo, and Paekche, but the mention of Kara is made only when it relates to the other three nations. There is also no entry of Kara in the systematic chronologies given in Volumes 29-31 of the Chronicles.

Why didn't Kim Pu-shik include Kara and write Sakuk-sagi (Chronicles of Four Kingdoms)? Was it because the texts on the basis of which he wrote his Chronicles did not include Kara? Was it because it was modeled after Chinese history of Three Nation Period? Was it because the contemporary Chinese texts on Korea rarely mentioned Kara? Or was it because Kara, as a federation of five or six "states", was different from other three nations in political structures? I am not a historian, and I leave to historians a resolution of these questions.[1]

Fortunately, Il Yŏn's Samguk-yusa (The Residual History of Three Kingdoms) includes a history of Kara, although the title of the book still refers to only three kingdoms, not four.[2] Chronology in Volume 1 includes Kara and gives the names of five "states", and Volume 2 gives an account of the foundation mythology. Thus we know that the Kara nation was founded in 42 A.D. by King Suro and lasted nearly five centuries until 532. However, the word samguk 'three nations' in both Samguk-sagi and Samguk-yusa has acted as a powerful mnemonic guide and had us forget the fact that there was a fourth kingdom in the Korean peninsula during the first five centuries of the Christian era. The following table gives a comparative chronology of the four nations.

Kingdom	Founder	Founded	Fell	Duration
Silla	Hyŏkkŏse	57 B.C.	927	984 years
Koguryŏ	Chumong	37 B.C.	668	705 years
Paekche	Onjo	18 B.C.	660	678 years
Kara	Suro	42 A.D.	532	490 years

Needless to say, it is our duty and task to reconstruct and recover the lost and neglected history of Kara. This paper represents a small such attempt with regard to its language.

3. The language of Kara

3.1 The current status of the study on the Kara language

It is reasonable to imagine that a nation that lasted five centuries whose cultures were distinctively different from her neighbors also had a distinctive language. In fact, there is a reference to "the Kara language" in Samguk-sagi, Vol. 44:

> A door/gate is called tol in the Kara language.

Yang Chu-dong (1945) was the first to draw an attention to

this passage, and pointed out that the Japanese pronunciation of the Chinese character meaning 'a door' was to. Lee Ki-Moon (1968; 1981), based on this and others found scattered in Volume 34 of Samguk-sagi, reasoned that the Kara language may have an affinity with the Koguryo language. But Kim Pang-han (1983:141-143) argued that the evidence is too fragmentary to rule out the possibility that the Kara language is essentially "southern", i.e., closer to the Silla language. Toh Soo-hee (1982:308-310) examined this problem and came to the conclusion that the language of the central region of the ancient period and the Kara language were quite similar. However, Kim Yong-jin (1982:53-72) argued that since a word unequivocally belonging to the Puyo branch (Koguryŏ) such as mai 'water, river' is found in the Kaya territory, in contrast to the corresponding Han branch (southern) word mɨr, the Kara language should be said to belong to the Puyo branch.

On the other hand Chin-W. Kim (1983:159-167) speculated that the Kara language may be related to Dravidian on the basis of a hypothesis that if Dravidian is related to Uralic, and Uralic to Altaic, then since Korean is said to be Altaic, the Kara language may be related to Dravidian, especially in view of an intriguing account in Samguk-yusa of how the queen and her entourage of the founder (King Suro) came from India.

3.2 The territory of Kara

We don't know for certain what books Kim Pu-shik consulted when he wrote the geography section in Samguk-sagi, but we may speculate that King Kyongdok (742-765) of Silla must have compiled a book of place names after the unification of Silla in order to incorporate the place names of the new conquered territories, and that Kim Pu-shik must have consulted this book. It has been Silla's practice to establish a chu (province) immediately after occupying a new territory. For example, during King Chinhŭng (540-575) when Silla occupied Hansan-kun of Koguryŏ, she renamed it as Hansan-chu. Likewise, Silla established Wansan-chu in 555 in the former Wansan of Paekche; Usu-chu in 637 during the reign of Queen Sŏndŏk in Usu of Koguryŏ; Habilla-chu in 658 during King T'aejong Muyŏl's reign in what used to be also Koguryŏ's land Habilla; etc.

The above examples show that when Silla renamed new territories, she in general continued with the old names, adding merely the suffix chu 'province' to the existing place names. But after the unification of the entire peninsula when Silla restructured her administrative units, some changes took place in the place names as well. The following table shows at a glance some of these changes:

Before Munmu(677)	During Shinmun(687)	After Kyŏngdŏk(757)
Sabŏl-chu	Sabŏl-chu	Sang-chu
Hansan-chu	Hansan-chu	Han-chu
Usu-chu	Suyak-chu	Sak-chu
Habilla-chu	Haso-chu	Myŏng-chu

Ungch'ŏn-chu	Ungch'ŏn-chu	Ung-chu
Wansan-chu	Wansan-chu	Chŏn-chu
Mujin-chu	Mujin-chu	Mu-chu

The above table shows that not only King Kyŏngdŏk renamed the provinces, there are also some differences, slight as they may be, between the names in the first column and those in the second. The names in the first column are as recorded in the geography section four in Samguk-sagi, and those in the second column are found in the geography sections one through three. We can surmise here that the names in the first column are older than those in the second and are closer to the original names in the old territories. In fact, King Kyŏngdŏk specifies that some names "were XXX in original Paekche names", or "were YYY in original Koguryŏ names."

But one must note here that King Kyŏngdŏk was not specific enough in tracing or in revealing the origin of the place names. He didn't go beyond the most recent owner of the names. For example, if a certain territory belonged to Koguryŏ when it was annexed to Silla, the place name was tagged as "an originally Koguryo name", even though the territory had belonged to Paekche for five centuries before it was occupied by Koguryŏ. This acts as a thick veil that makes the past very opaque.

A similar fate must have fallen to the place names of Kara. As Kara was annexed to Silla (532), she must have given Silla her place names as well. And these names must have undergone some changes more than two centuries later (757) when King Kyŏngdŏk undertook reorganization of administrative structures. But the "veil" makes us unable to see the original Kara names, if any, in the surviving place names. Our task then is to sift through the available material and discover or rather recover the original Kara names.

Fortunately, some evidence, fragmentary as it may be, is found in Geography section one of Samguk-sagi:

> Koryŏng-gun was originally Koryŏng-state of Kaya,
> Silla renamed it Kodongram-gun after occupying it.
>
> Kimhaesogyŏng is the name of old Kŭmgwan-nation,
> alias Karak-nation or Kara...

A search through Geography section one, Volume 34 of Samguk-sagi turned up the following Kara names:

1. Koryŏng-kaya > Kodongram (alias konung) > Hamnyŏng
2. Kŭmgwan (alias karak, alias kaya) > Kŭmhae-sogyŏng > Kŭmju
3. Asiryang (alias Hana-kaya) > Haman

To these, the following may be added:

4. Lee Pyŏng-do's (1959:388) reconstruction of five Kaya as shown in the following table:

In Samguk-yusa	In Ijo-saryak*
i. Hara-Kaya (Haman)	Kŭmgwan-Kaya (Kimhae)
ii. Koryŏng-Kaya (Chinju?)	Koryŏng-Kaya (Chinju?)
iii. Tae-Kaya (Koryŏng)	Pihwa-Kaya (Ch'angnyŏng)
iv. Sŏngsan-Kaya (Sŏngju)	Ara-Kaya (Haman)
v. So-Kaya (Kosŏng)	Sŏngsan-Kaya (Sŏngju)

*Ijo-saryak is an old Koryo text. In the parentheses are given the current place names.

5. Five Kaya was reconstructed as follows by Ooda Shoogo, a Japanese acholar (his A course in Korean history: p. 140):

Samguk-yusa/ Tongguk-yŏji-sŭngnam	Ijo-saryak
Federation: Kŭmgwan-Kaya (Kimhae)	Tae-Kaya (Koryŏng)
i. Ara-Kaya (Haman)	Kŭmgwan-Kaya (Kimhae)
ii. Koryŏng-Kaya (Hamnyŏng)	Koryŏng-Kaya (Kari)
iii. Tae-Kaya (Koryŏng)	Pihwa-Kaya
iv. Sŏngsan-Kaya (Sŏngju)	Ara-Kaya (Haman)
v. So-Kaya (Kosŏng)	Sŏngsan-Kaya (Sŏngju)

6. The strongest evidence telling us the territorial boundaries of Kara nation is the following royal tombs:

i. Royal tomb in Imdang-dong, Kyŏngsan-up, Kyŏngsan-gun, North Kyŏngsang province
ii. Royal tomb in Mii mountain, Haman-gun (=Hara-Kaya), South Kyŏngsang province
iii. Royal tomb in Chidong mountain, Koryŏng-gun (=Tae-Kaya). North Kyŏngsang province
iv. Royal tombs in Kyo-dong and Kyesŏng-dong, Ch'angnyŏng-gun, South Kyŏngsang province
v. Royal tomb in Pokch'ŏn-dong, Tongnae-ku, Pusan
vi. Royal tomb in Unbong-myon, Namwŏn-gun, North Chŏlla province

The contour of territory D-d in Figure 1 was arrived at on the basis of the above.

3.3 The Kara language material

(1) Place names

In the following are the place names in Geography section one of Volume 34 of Samguk-sagi. I divided them into two groups: those that belonged to the Silla territory from the beginning (area D-c) and those that are assumed to have originally belonged to the Kara territory (area D-d).

i. Place names in area D-c (Silla terrotory)

kun(county)	hyon(town)	before 757	after 757	Early Koryo
1		suju	lyech'ŏn	p'oju
	a	haji	yŏngan	p'ungsan
	b	lansan	anin	?
	c	kunp'um	kayu	sanyang
	d	chŏka	ŭnjŏng	ŭnp'ung
2		kojiya	koch'ang	andong
	a	ilchik	chiknyŏng	ilchik
	b	yŏlhye	ilgye	?
	c	kuhwa	kogu	ŭysŏng
3		somun	munso	ŭysŏng
	a	ch'ilp'ahwa	chinbo	posŏng
	b	hahwaok	piok	piok
	c	asihye	anhyŏn	anjŏng
	d	mudong-miji	tanmil	tanmil
4		t'oehwa	ŭych'ang	hŭnghae
	a	pihwa	angang	angang
	b	chihaeng	kirip	changgi
	c	tongnaeum	sinkwang	sinkwang
	d	kŭnjoji	imjŏng	ang'il
	e	mohye	kigye	kigye
	f	ŭmjŭppŏl	ŭmjŭppŏl	angang
5		chŏlyahwa	imgo	yŏngju
	a	chukchang-ibugok	changjin	changjin
	b	kolhwaso	imch'ŏn	yŏngch'on
	c	todonghwa	todong	yŏngch'on
	d	sajŏnghwa	sinnyŏng	sinnyŏng
	e	maeyŏlch'a	kugu	sinnyŏng
6		sŏraböl ~ sŏyaböl ~ sŏböl ~ kŭmaŏng		
7		kudosŏng	taesŏng	ch'ŏngdo
	a	akchi	yakchang	kyŏngju
	b	moji	tonggi	kyŏngju
8		sŏhyŏngsan	namsŏng	kyŏngju
	a	top'umhye	namgijŏng	kyŏngju
	b	kunnaejong	chunggi	kyŏngju
	c	turyang-miji	sŏgi	kyŏngju
	d	ugok	pukki	kyŏngju
	e	kwanha-ryangji	makya	kyŏngju
9		mohwa	imgwan	kyŏngju
	a	yulp'o	tongjin	ungju
	b	kulha-hwach'on	hagok	ungju
10		saengaŏryang	tong'an	kyongju
	a	uhwa	up'ung	ungju

ii. Place names in area D-d (Kara territory)

kun	hyon	Kara-757	After 757	Early Koryo
11		kodonglam	kolyŏng	hamnyŏng
	a	kahae	kasun	kaŭn
	b	kwanmun	kwansan	munkyŏng
	c	hoch'ŭk	hogye	hogye
12		samnyŏnsan	samnyŏn	poryŏng
	a	ulmae	ch'ŏngch'ŏn	ch'ŏngch'ŏn
	b	kul	nosan	ch'ŏngsan
13		kilsisan	kwansŏng	kwansŏng
	a	sorisan	risan	risan
	b	adonghye	hyonjin	anŭp
14		taptalbi	hwaryŏng	hwaryŏng
	a	toryang	toan	chungmo
15		saboĭl	sangju	sangju
	a	sŏknihwa	ŭmhyo	ch'ŏngni
	b	talgi	tain	tain
	c	chinaemiji	hwach'ang	?
16		kiltong	yŏngdong	yŏngdong
	a	chobich'ŏn	yangsan	yangsan
	b	aora	hwanggan	hwanggan
17		ilsŏn	kosŏn	sŏnju
	a	mohye	hyoryong	hyoryong
	b	?	idonghye	?
	c	hodongmyŏk	kunwi	kunwi
18		kamsomun	kaeryŏng	ch'ŏngju
	a	kŭmmul	ŏhae	ŏhae
	b	kŭmsan	kŭmsan	kŭmsan
	c	chip'umch'ŏn	chirye	chirye
	d	musan	mup'ung	mup'ung
19		iri	sŏngsan	kari
	a	sadonghwa	sudong	?
	b	taemok	kyeja	yakmok
	c	ponp'i	sinan	kyŏngsan
	d	chŏksan	tosan	?
20		wihwa	such'ang	susŏng
	a	takguhwa	taegu	taegu
	b	p'alkŏri	p'alli	p'algŏ
	c	tasa	habin	habin
	d	sŏlhwa	hwawŏn	hwawŏn
21		apnyangso	changsan	changsan
	a	ch'isŏnghwa	haean	haean
	b	majinlyang	yŏryang	kusabu
	c	hosahwa	chain	chain
22		taekaya	koryŏng	koryŏng
	a	chŏkhwa	yaro	yaro
		kasihye	sinpok	?
23		kŏyol	kŏch'ang	kŏch'ang
	a	namnae	yŏsŭn	kamŭm
	b	kaso	hamŭm	kaso
24		sokham	ch'onlyŏng	hamyang
	a	mosan	unbong	unbong
	b	mari	lian	lian

25		taeryang	kang'yang	hyŏpchu
	a	samji	samgi	samgi
	b	ch'op'al	p'algye	ch'ogye
	c	sini	sŏnsang	sinbŏn
26		pijahwa	hwawang	ch'angnyŏng
	a	ch'uryang	hyŏnhyo	hyŏnp'ung
27		ch'uhwa	milsong	milsong
	a	sŏhwa	sangnak	yŏngsan
	b	ch'up'o	milchin	?
	c	oyasan	ogusan	ch'ŏngdo
	d	kyŏngsan	hyŏngsan	ch'ŏngdo
	e	solgisan	sŏsan	ch'ŏngdo
28		aapnyang	yangju	yangju
29		kŏch'ilsan	tongnae	tongnae
	a	taejŭng	tongp'yŏng	tongp'yŏng
	b	kaphwa	kijang	kijang
30		kimhae-sokyŏng	kimhae-kyŏng	kŭmju
31		kulcha	ŭian	ŭian
	a	ch'ilt'o	ch'ilche	ch'ilwŏn
	b	kolp'o	happ'o	happ'o
	c	ungji	ungsin	ungsin
32		asiryang	haman	haman
	a	sosam	hyŏnmu	sosam
	b	changham	sŏnnyŏng	sŏnnyŏng
33		kŏt'a	chŏngju	chinju
	a	kajuhwa	kasu	kasu
	b	kulch'ŏn	?	?
34		kwŏlchi	kwŏlaŏng	kangsŏng
	a	chŏkch'on	tanŭp	tangye
	b	p'umch'ŏn	sanum	sanum
35		handasa	hadong	hadong
	a	?	sŏngnyang	kŭmnyang-bukok
	b	sodasa	agyang	agyang
	c	p'och'on	haŭp	haŭp
36		kilcha	kosŏng	kosŏng
	a	munhwaryang	?	?
	b	samul	sasu	saju
	c	ilaon	sangson	yongson
37		sang	kŏje	kŏje
	a	kŏro	aju	aju
	b	maejini	myŏngjin	myŏngjin
	c	songbyŏn	namau	aongbyŏn

In the table above, 1 through 10 are original place names of Silla, and 11 through 37 are those whose origins are in Kara. Undoubtedly, these Kara names must have been affected by external factors, but if we can "undo" these elements, then we will have a valuable source of Kara material. In the following map, the numbers represent the approximate locations of the county names in the above table. Due to space limitations, the village names have not been placed in the map.

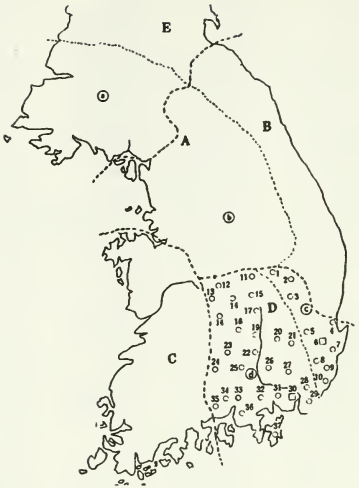

Figure 2: Distribution of Kara (D-d) and Silla (D-c) place names

(2) Other source material

(a) Names of states

From internal sources: karak, kaya, hara-kaya, koryŏng-kaya, tae-kaya, sŏngsan-kaya, so-kaya, kŭmgwan-kaya, pihwa-kaya, sang-kara-do, ha-kara-do

From Japanese sources: karang, nam-kara, ŭibu-kara

(b) Names and titles of kings

In Samguk-yusa vol. 1	In Samguk-yusa vol. 2
1. suro	suro
2. kŏdŭng	kŏdŭng
3. map'um	map'um
4. kŏjŭlmi, kŭmmul	kŏjŭlmi alias kŭmmul
5. ip'um	ihyep'um
6. chwaji, alias kŭmt'o	chwaji alias kŭmjŭl
7. ch'wihi alias kŭmhi	ch'wihi alias jŭlga
8. chiji alias kŭmji	chiji alias kŭmji
9. kyŏmji	kyŏmji alias kŭmgyŏm
10. kuhyŏng	kuhyŏng

In Samguk-sagi vols. 32 and 34, we find several royal names that are not found in Samguk-yusa, e.g., ijinago, naejinjuji, tosŏlchi, kasil, etc. These are, however, the names of kings of one of the Kaya states, not the names of the kings of Federal Karak. In addition, there is a mention in volume 29 of Tongguk-yŏji-sŭngnam that King ijinago had a nickname noejilchuil and that King suro had a nickname noejilch'ŏng'ye.

(c) Names of Karak chieftains (gan/kan's)

ado-gan > agung-gan
p'ido-gan > p'ijang-gan
lyusu-gan > lyugong-gan
sinch'ŏn-gan > sindo-gan
yŏdo-gan > yŏgye-gan
odo-gan > osang-gan
lyuch'ŏn-gan > lyudŏk-kan
och'ŏn-gan > onŭng-gan

In the above, the latter names are revised ones.

(d) Names of queens

hŏhwanghu:	queen of the 1st king suro
mojŏng-buin:	queen of the 2nd king kŏdŭng
hogu:	queen of the 3rd king map'um
aji:	queen of the 4th king kŏbimi
chŏngsin:	queen of the 5th king ich'okp'um
pok:	queen of the 6th king chwaji
indŏk:	queen of the 7th king ch'iihi
pangwon:	queen of the 8th king chiji

(e) Personal names

sinbo, kigwang, agung, kŭkch'ung, toryŏng(?), chinsa, kŭmsang, punjŭlsu (ijŭl), t'alchi (nijŭlgŭm), cholchigong, sejong, mudo, mudŭk, kanhyŏk

(f) Official titles

kan, kak-kan, abi-gan, a-gan, taea-gan, kŭp-kan, sa-gan, sanong-gyŏng, ch'ŏnbu-gyong, chŏngjong-gam, ijŭlgŭm

These names show that Karak gradually adopted Silla titles. For example, ijŭlgŭm here corresponds to Silla's nijŭlgŭm. The father of the wife of king kuhyŏng is recorded as punjŭlsu-ijŭl. The last part of this name must have been ijŭlgŭm, gŭm having been lost in the process of transcription or transmission.

(g) Others

kuji, mangsan-do, nanyo, kyejip, pyŏlp'ojin, todo-ch'on, chup'o-ch'on, nŭnghyŏn, kich'ulbyŏn, kuha-kuha

I have listed most of the words whose origins are thought to

be in the Kara language. Our task is to add to this from external sources, especially from old Japanese texts. A comparative and critial analysis of these materials should give a rough shape of Kara words. It should also enable us to determine how the Kara language has changed over the years.

4. Distinctive features of the Kara language

Ancient historical texts recorded that Kara is a federation that rose out of Pyŏn-han, one of three Han nations situated in the southern part of the Korean peninsula. This leads us to conclude that the Kara language belonged to the Han branch. But a good portion of the Kara material presented above does not appear to support this lineage. For example, a statement in Samguk-sagi quoted above that "tor is a Kara word for 'door' in Silla" can be taken to mean that the Kara language is very different from the Silla language. If true, this implies that Kara does not belong to the Han branch, for the Silla language is thought to be of a Han language. It is true that an example involving a single lexical item cannot be a definitive clue in determining a genetic relationship. Our task then is to find and examine more examples of the tor type that shows a contrast between the Kara and Silla languages. I think this will go a long way in defining the characteristics of the Kara langusage. In the following are a dozen or so lexical items of this kind.

(1) *mai 'water, well, stream' : *mɨr 'water'

As can be seen in Figure 3, mai is found once in area A-a, 14 times in area A-b (▲ marks 2 to 15), 4 times in area B 9 marks 16-19), three times in area C (▲ marks 20-22), twice in area D-d (▲ marks 23-24), but none is found in area D-c, the Silla territory. The distribution of this item is thus confined to the central region of the peninsula. On the other hand, mɨr appears to be confined to the southern region: it is found thrice in area C, and once in area D-d. I think the one example in area A should be regarded as having spread from the south.

Divergence of what must have been a cognately single lexical item into two forms mai and mɨr was discussed in Toh 1984. It is enough to point out here that two different forms were in use in the Kara language.

(2) *tar 'high, moutain' : *mori 'mountain'

tar is found once in area A-a, 5 times in area A-b (⊕ marks 2-6), 6 times in area B (⊕ marks 7-12), 4 times in area D-d (⊕ marks 13-16), and twice in the area E. It is worth noting that this item contrasts with *mori > moy 'moutain' in the Han branch language.

(3) *tu 'riverbank'

This item is found 3 times in area A-b (✱ marks 1-3), twice in area B (✱ marks 4-5), and once in area D-d, but is not found in areas C and D-c. It is therefore impossible to know what the corresponding word was in the Han branch, although tutɨlk in Middle Korean and the current ttuk are likely to be its

decendants.

(4) *mir 'three' : *siri > *səi > *səy 'three'
This item is found once in the border area between areas A-b and B, and 5 times (● marks 2-6) in area D-d. *sir > səy is also found in area B. It is interesting that *mir and *siri coexist in the same area B.

(5) *iri 'star' : *pyəri 'star'
*iri is found in area D-d (the △ mark in the figure), the old Kara territory, and therefore is a significant example. It is interesting to note that the upper tributary of the Naktong river is still called iri-ch'ŏn or sŏng-ch'ŏn (ch'ŏn means 'stream' and sŏng is a Sino-Korean character meaning 'star').

(6) *sar 'blue' : *korang 'blue'
sar is found once in the north above area A-a (cf. sar-au = ch'ongch'on-kang 'blue/clear river'), once in area A-b, three times in area D-d (◎ marks 3-5), and once in area B. This contrasts with korang in area C as in the place name korang-puri > ch'ŏng-yang.

(7) *koma 'a bear'
This item is found once in area A-a, also once in area A-b, twice in area C (■ marks 3-4), and once again in area D-d. It should be noted that this lexical item is found as far south as area D-d, although the animal is not indigenoous to the area. See Toh (1979.429-512) on the origin of koma.

(8) *ap 'hill, ridge'
This item is found 3 times in area A-a (◎ marks 1, 2, and 4), twice each in areas A-b (◎ marks 3 and 5), B (◎ marks 6 and 7), D-d (◉ marks 8 and 9), and E, but is not found in areas C and D-c. This may indicate that the item migrated from north to south.

(9) *paɨy 'rock, mountain-pass'
This lexical item is found 3 times in area A-a (□ marks 1-3), 5 times in area A-b (□ marks 4-8), and 3 times in area B (□ marks 9-11), but is not found in other areas (C, D and E). This fact leads us to ponder if this item was confined to the central region and therefore is not of the Han branch, and if so, what the corresponding Han word might be. Scholars have assumed that pawi 'rock' in contemporary Korean derived from pahɨy in Middle Korean which in turn came from the Silla language. But its limited distribution in the central region may cast a doubt on this assumption.

(10) *i (<*ki) 'castle' : *cas 'castle'
This item is found 6 times in area A, 3 times in area B, once in area E, 8 times in area C, and twice in area D-d, but is not found in area D-c. For *ki > *i, see Toh (1984.47-51).

(11) *nami 'sea' : *patʌr 'sea'
nami is found along the west coast (once in area A, and

three times in area C), while pat r is found along the east coast (southern Kang'wŏn province).

(12) *na 'ground' : *ra 'earth'

na is found in central region (area A), while ra is found in the southern region (area D). This regular correpondence is broken by a single occurence of na in area D-d, and a couple of occurencea of ra in the north in east-central Kangwŏn province. This is probably due to a diffusion or language spread.

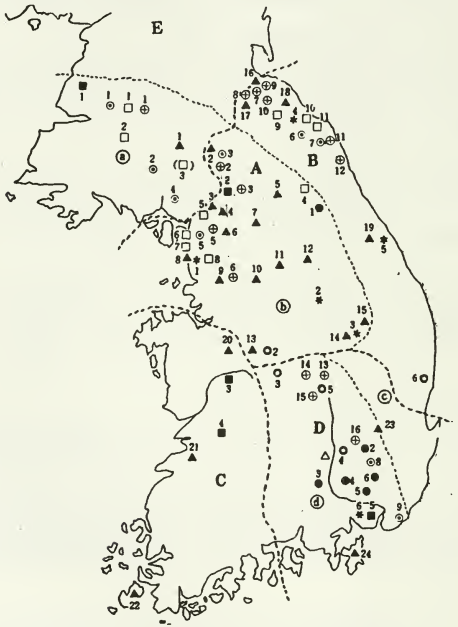

Figure 3: Distribution of similar and dissimilar items in Early Paekche and Kara language

5. The relation between the Early Paekche and the Kara languages

When two languages show similarities, it is not always easy to determine if the similarities are due to a genetic affinity or simply due to a close language contact. Levin (1980) raised this quesiton with respect to Old Korean and Old Japanese. It is possible that two languages which were originally genetically related may no longer be so recognizable after a very long period of separation, and any similarities may then be ascribed as due to language contact. Conversely, it is also possible that two unrelated languages may have had an extensive contact, but when this historical fact is blurred by the mist of time, one may be tempted to ascribe the similarities as due to a genetic affinity. I think such is the case with the Early Paekche language and the Kara language.

An examination of the distributional pattern of a dozen or so old lexical items has revealed that areas A, B, and D-d share common features that lack in areas C and D-c. One may ask why the features found in areas A and B are also found in area D-d, but not in areas C and D-c. We can answer this question in two ways. One is to say that it is because the Kara language (area D-d) was genetically related to the Early Paekche language (area A), and the other is to say that it is because two nations had a very close contact during the Early Paekche period. I am inclined to take the latter view (see Toh 1984).

During the Early Paekche period, Paekche had a very close and frequent contact with Japan, transmitting much of her old culture to Japan. Kara, because of her geographical location or because of her friendly relation with Paekche, must have played the role of the mediator, a stepping stone or a bridge, in the trade between Paekche and Japan. Much of the vocabulary that shows similarities may have been due to this geo-historical fact.

A word of caution is in order here, however. When one is inclined to one side, one tends to be blind to the other side. We have so far tried to find in the Kara territory those linguistic features that are found in the central region, and indeed, we have found a bunch. But at the same time, one should not close one's eyes to the fact that some features found in the Kara territory are not found in areas A and B. Contrasts between na and ra 'earth' (item 12 above) and between iri and pyəri 'a star' (item 5 above) are such examples. What is the significance of these coexisting forms? Other examples of coexisting forms are *pɨr 'field', *mir and *siri > səy 'three', etc. Besides these, there are items that definitely look like belonging to the Han branch in the Kara territory such as *mɨr 'water', *kəcir 'rough', *kəro 'duck' etc. We cannot determine at this point which one played the role of a superatratum and which one the role of a substratum. This belongs to a future research. A hasty speculation one make here is that in view of the fact that Kara was situated in the south and her parent is likely to be Pyŏn-han, the Kara language must have been a Han language in its basic and essential character.

NOTES

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[1]The following remark is made in C-W. Kim (1983.166-7):

> I am a linguist, not a historian. But a historial note is in order. By all accounts, Kaya was a full-fledged nation that lasted five centuries from 42 to 532 AD. Yet inexplicably, it has been neglected by historians and in the public mind. I can see two reasons for this, one internal and the other external. Internally, Kim Pu-shik, the author of Samguk-sagi (1145), was a faithful toadist to China, and modeled his book after the Three Nation Period in China, calling his book, Chronicles of Three Kingdoms, thus excluding Kaya, the least influenced by Chinese culture. To my mind, the five centuries preceding Silla's unification of the peninsula should be called "Four Kingdom Period", not "Three". The external reason is that during the Japanese colonial period, Japanese historians tried to hide the fact that Tsushima Island was once a terrotory of Kaya (it was lost to Japan in 408 AD). There is also a theory that a princess of Kaya went over to Japan and became a founding queen there. It is not surprising for the colonialists to attempt to distort and/or obfuscate history to suit the purpose of colonialism. What is surprising is that the historians of a once subjugated but now liberated nation would be content to accept the history of their nation written by colonial masters.

[2]There are many indicaitons that Il yŏn, the author of Samguk-yusa tried to give Kara a status equal to other three contemporary nations. He must have lamented the fact that in Kim Pu-shik's Samguk-sagi, a history of Kara was not included. It is significant to note that the title of the volume on Kara is Karak-kukki, ki 'a record, a history' being the same affix as gi in Samguk-sagi, and that the layout of the volume is the same as the one used by Kim Pu-shik for the other three in his book.

[3]Chin-W. Kim (1983:161-2) makes the following speculation:

> The triangle relation is based on the assumption that if A is related to B and B is related to C, then by the transitivity relation, A is also related to C. On one hand, there has been a remarkable resurgence in recent years in attempts to relate Dravidian to Uralic, e.g., Burrow 1943, Bouda 1953, Sebeok 1945, Tyler 1968. On the other hand, there have been attempts to link Uralic and Altaic, enough for the term "Ural-Altaic" to be coined... if the above assumptions hold a grain of truth, then almost by default, but by a logical relation, one must say that Dravidian and Altaic are related... Attempts to relate Altaic and Dravidian have in fact been made, e.g., Meile 1949, Menges 1964, 1969.

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FORTITION OF LOANWORDS IN KOREAN

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This paper examines the fortition[1] phenomenon of English loanwords used by Korean speakers in terms of some criteria proposed in natural phonology to distinguish between rules and processes and presents evidence to show that the application of a process in the nativization of loanwords is in proportion to its productivity in native words.

Natural phonologists claim that borrowing could and should be handled with reference to a distinction between rules and processes. The reason for the distinction is that rule exception is an overly powerful device, and there is no way of accounting for assimilated and unassimilated borrowings with such device. Stampe(1973a) contends that the recent phonological work "has been marred by a failure to make the distinction between processes and rules, on the mistaken assumption that all constraints and substitutions are governed by acquired rules" (p.46). Yavas (1982) expresses the importance of the distinction as "the trademark of natural phonology" (p.123).

Although "the real nature of such rules is not entirely clear" (Donegan and Stampe 1979:143), there are differences in many respects. The important differences will be cited here from Donegan and Stampe (1979:144-145).

(1)

Process	Rules
a. phonetically motivated	lack of phonetic motivation
b. innate	learned
c. unconscious application	conscious application
d. no violation without special effort	allow exceptions
e. applied to tongue-slips, foreign words	not applied to such cases
f. optional or obligatory	obligatory
g. ordered later	ordered earlier

As an example of a natural process, Stampe (1973a:44) cites the aspiration of voiceless stops at the onset of stressed syllable in English. Velar Softening and Tri-syllabic Laxing are classified as learned rules.

Now, let us examine the fortition phenomenon of Korean obstruents. English initial voiceless stops are perceived by Korean speakers as aspirated stops.[2] while the same segments are regularly replaced by lenis ones when unreleased and by aspirated ones plus epenthetic vowel /ɨ/ when released. However, English initial voiced stops are not so simple and neat as voiceless stops. Pae (1967a:40) notes that "English /b, d, g/, [are perceived by Korean speakers] as the tense series in most cases" (underline mine) and assume that such perception "seems to be due to the strong voicing quality of these consonants compared with the fricative nature of the intervocalic lax varieties of Korean /p t k/." But his observation is not sufficiently convincing. In A Dictionary of Loanwords in Korean (Pae 1981), contrary to his observation, most word-initial voiced stops are transcribed in the Korean script as corresponding to lenis stops. For example, among 247 English loanwords with /g/ in the word initial position, only 42 loans are transcribed as /k'/ and the rest, as /k/. Notice that his transcriptions reflect "the linguistic facts," as claimed in the foreword of his dictionary. Examine the following examples from his dictionary:[3]

(2) English /b, d, g/ > Korean /p',t',k'/

	game	> /k'eim/
	gown	> /k'aun/
	gas	> /k'ɐsɨ/
	bus	> /p'əsɨ/
	boat	> /p'ot^{h}ɨ/
	butter	> /p'ata/
	dance	> /t'ɐnsɨ/
	dam	> /t'ɐm/
	dollar	> /t'alla/

(3) English /b, d, g/ > Korean /p, t, k/

	guide	> /kaitɨ/
	gag	> /kɐkɨ/
	guerilla	> /kelilla/
	barricade	> /palik^{h}eitɨ/
	bunker	> /pəñk^{h} /
	boxing	> /poksiñ/

dial > /taial/

dumping > /təmphiñ/

docking > /tok^{h}iñ/

His assumption for the fortis-perception seems to be inadequate in that there is no evidence to support it. Assuming an analysis along the lines of Ohso (1971) and Lovins (1974), I would like to suggest that Korean speakers perceive the English voiced stops as Korean lenis counterparts by way of "backwards derivation" of the stop voicing process. The fortition process of lenis stops, however, is accounted for in terms of the fortition process in syllable-initial position. The fortition process is also evidenced by the diachronical changes in Korean. According to Huh (1965:429-430), the fortition process of consonant cluster phonemes was expedited by that of word-initial lenis in the Korean phonological history during the sixteenth to the eighteenth centuries. The following examples verify the existence of the lenis-fortition process:

(4) /koc/ > /k'oc^{h}/ `flower'

/pulhwi/ > /p'uli/ `root'

/kac^{h}i/ > /k'c^{h}i/ `magpie'

/kəskta/ > /k'əkta/ `pluck'

/k+t^{h}/ > /k'+t^{h}/ `end'

The above examples (3) give evidence that the lenis-fortition process is not so productive as to operate upon the nativization of all recent loanwords. Observe the following process and examples:

(5) Stop Voicing

$$\begin{bmatrix}-\text{cons}\\-\text{tense}\end{bmatrix} \text{ ---> } /[+\text{voice}]\_\_\_\_\_[+\text{voice}]$$

(6) a. /k^{h}ăti/ [k^{h}ădi] `caddy'

/t^{h}ăñko/ [t^{h}ăñgo] `tango'

/k^{h}eip+l/ [k^{h}eib+l] `cable'

b. /k^{h}əp-i/ [k^{h}əbi] `cup' + subjective marker

/k^{h}uk-+l/ [k^{h}ug+l] `cook' + objective marker

/cip-+n/ [c'ib+n] `jeep' + topicalizer

The examples (6) show that the stop voicing process is obligatory and thus so productive that it applies not only to obstruents in voiced environments of loanwords but also to those in the final position followed by Korean vowel-initial affixes.

In Korean, there are two different kinds of fortition phenomena which occur when a lenis obstruent is preceded by an unreleased stop or when it is in voiced environments. The following examples show different fortition phenomena clearly:

(7) a.	/ot-kam/	[otk'am]	`cloth'
	/mat-ton/	[matt'on]	`cash'
	/kuk-pap/	[kukp'ap]	`rice served in soup'
	/mit-cul/	[mitc'ul]	`underline'
	/pap-sot/	[paps'ot]	`rice pot'
b.	/san-kil/	[sank'il]	`mountain path'
	/kal-tʌ́/	[kalt'ʌ́]	`reed'
	/san-pul/	[sanp'ul]	`forest fire'
	/cam-cali/	[camc'ari][4]	`sleeping place'

For ease of reference, let us call the former case `Post-obstruent Fortition' and the latter case `Post-sonorant Fortition.'[5] The Post-obstruent Fortition phenomenon is easily explained in terms of articulatory phonetics. The complete closure of an unreleased stop causes buildup of oral air pressure which results in tensing of the following lenis obstruent. Kim-Renaud (1974:131) formulates the phenomenon as follows:

(8) fortition

$$\begin{bmatrix}-\text{rel}\\-\text{son}\end{bmatrix} \text{ ---> [+tense] / [-rel] } \_\_\_\_\_$$

The Post-obstruent Fortition is so productive that its application to loanwords is manifested in the following examples:

(9) /pik-keim/	[pikk'eim]	`big game'
/nok-taun/	[nokt'aun]	`knock down'
/k^{h}ik-poksiñ/	[k^{h}ikp'osiñ]	`kick boxing'
/s̈lip-taun/	[s̈ript'aun]	`slip down'

/s+k^h+lӕp-puk/	[s+k^h+rӕpp'uk$^=$]	`scrapbook'
/hat-tok/	[hatt'ok$^=$]	`hot dog'
/pas+k^{h}et-pol/	[pas+k^{h}etp'ol]	`basketball'
/aut-pol/	[autp'ol]	`out ball'

The Post-sonorant Fortition phenomenon is, however, not so simple as to be neatly explained by a few phonological processes, because there are too many counter-examples which violate the proposed rules. The fortition phenomenon, which has traditionally been called `sai sios'(interval-s) phenomenon, has been analyzed by many linguists(C.-W. Kim 1970, Kim-Renaud 1974, Chung 1980, K. H. Lee 1982, among others).

The Post-sonorant Fortition occurs in compound nouns, Chinese loanwords, verb stem + suffixes, and modifier + nouns. What is to be discussed here is not an analysis of the whole fortition phenomena, but fortition in compound nouns in order to provide evidence for or against the application of fortition to loanwords. The reason for limiting the question to compound nouns is that, as might be expected, nouns are by far the most frequently borrowed class of words.[6]

Before going further, let us survey a few studies of the fortition phenomenon. In his insightful analysis of t-epenthesis in Korean with the purpose of incorporating it with boundary phenomena, C.-W. Kim (1070:17) formulates the following rules for fortition:

(10) $$\emptyset \longrightarrow \begin{cases} n \;/\; C + \_\_\_ + \begin{Bmatrix} i \\ y \end{Bmatrix} & \text{(a)} \\ t \;/\; + \_\_\_ + \; C & \text{(b)} \quad (+\text{:word boundary}) \end{cases}$$

Rule (10a) inserts n between ++ (compound boundary) when it is preceded by a consonant and followed by i or y. The following examples show this kind of fortition which has been called `n-insertion':

(11) /k'oc^h++ip^h/ [k'onnip$^=$] `flower petal'

/masan++yək/ [masannyək$^=$] `Masan station'

Rule (10b) inserts t between ++ when the compound boundary is preceded and followed by a consonant, and the Post-obstruent Fortition (8) applies, and finally the Consonant Cluster Simplification process deletes the now unnecessary t.

Kim-Renaud (1974:163) formulates a similar rule to account for the fortition phenomenon:

(12) ∅ ---> t / [+son] ___ ¢ ¦-cons¦ (C: compound boundary)
¦-tense¦

She mentions that the application of t-epenthesis is optional if one or both of the stems are polysyllabic.

According to both rules (10b) and (12), all compound nouns are supposed to undergo fortition without exception. However, a closer look at more compound nouns reveals many examples which do not undergo fortition although the environments are met. Observe the following examples:

(13)	/pom-ka‡l/	[pomga‡l]	`spring and fall'
	/sil-pi/	[silbi]	`string-like rain'
	/s'al-sul/	[s'alsul]	`rice wine'
	/cims‡ñ-pal/	[cims‡ñbal]	`animal's paw'
	/son-capi/	[sonjabi]	`knob'
	/kibon-pəpc^{h}ik/	[kibonbəpc^{h}ik$^{=}$]	`fundamental law'

The examples (13) obviously indicate that the fortition phenomenon occurring in compound nouns is not phonologically explained by the proposed rules.

Chung (1980;56) argues that "fortition marks the special structure and meaning of the combination and also that it is not boundaries but lexical categories that determine the application of fortition." He characterizes the environment for fortition as follows: "the first element of the two elements in a compound should be the modifier of the second and the second should be an original noun (not a derived noun)" (p.42).[9] He revises the fortition rule as follows:

(14) C ---> [+tense] / C
[+lax] [+son]$_{N}$ $_{N}$[___

And he proposes to mark each compound lexically as to the application of the fortition rule. Therefore, lexical items have the rule feature [-Rule 14] when they do not undergo fortition.

At the first sight, his revised fortition rule seems to capture all the appropriate generalizations, but still we have the question of how to classify compound nouns as to the application and non-application of the rule. He assumes that his semantic and lexical category can solve this problem, but here again we can find counter-examples to his criteria. For

example, he classifies a determiner + noun as a non-compound which does not undergo fortition. It turns out, however, this is not the case. According to Minjung-sugwan's Korean Dictionary (1974), the word an is a determiner which means `woman.' Whenever this determiner occurs before nouns which have lenis in the initial position, they undergo fortition. Observe the following examples:

(15)	/an-ton/	[ant'on]	`woman's money'
	/an-pumo/	[anp'umo]	`mother'
	/an-salam/	[ans'aram]	`wife'
	/an-cuin/	[anc'uin]	`landlady'

Another case of non-fortition is a compound noun of which the first element describes the shape or material of the second. If Chung's claim were correct, compound nouns such as /sʌ̈ñs n-kuk/ `fish soup,' /namul-kuk/ `vegetable soup,' /k^{h}oñ-kuk/ `bean soup,' would be [sʌ̈ñs n-guk$^{=}$], [namul-guk$^{=}$], [k^{h}oñguk$^{=}$], respectively. On the contrary, fortition occurs in these words.

Let us examine Chung's fortition cases; if the first element denotes time, place, origin (not possession), use, or proper name, or the second element is a monosyllabic Sino-Korean word, then the compound nouns undergo fortition. The following examples show that some of his semantic criteria are not adequate to predict all cases of fortition:

(16)	a. Denotation of `time'		
	/ka$\overset{\cdot}{\text{l}}$-poli/	[ka$\overset{\cdot}{\text{l}}$bori]	`autumn barley'
	/kyəul-cam/	[kyəuljam]	`hibernation'
	/sətal-k$\overset{\cdot}{\text{m}}m\overset{\cdot}{\text{m}}$/	[sətt'alg$\overset{\cdot}{\text{m}}m\overset{\cdot}{\text{m}}$]	`New Year's Eve'
	b. Denotation of `place'		
	/pata-pʌ̈m/	[padabʌ̈m]	`sea snake'
	/t'añ-pəsət/	[t'añbəsət$^{=}$]	`mushroom'
	/t$\overset{\cdot}{\text{l}}$-palam/	[t$\overset{\cdot}{\text{l}}$baram]	`field wind'
	c. Monosyllabic Sino-Korean word		
	/kyot^{h}oñ-pi/	[kyot^{h}oñbi]	`transit expense'
	/kica-tan/	[kijadan]	`press men'

/cocoñ-sa/	[cojoñsa]	`pilot'
/sañ-cəm/	[sañjəm]	`store'

Now, let us consider the reason why fortition occurs, i.e. what is the function of fortition? Many Korean grammarians have been concerned with this question and proposed various reasons for t-epenthesis. The main points will be cited here.

(17) a. to prevent the initial consonant of the second element from being voiced.
b. to represent the tensing of the initial consonant.
c. to achieve a phonetic harmony.
d. to represent a genitive marker.
e. to strengthen the semantic tie.

All the above views except (17d) can be interpreted as an attempt to prevent the initial consonant of the second element from being weakened in order to enhance the distinctiveness of two elements of a compound noun. As far as the fortition cases are concerned, this interpretation is sufficiently convincing. This is, however, not the whole story of fortition. Due regard has to be paid to the fact that the number of non-fortition cases is not so small as to treat them as exceptions. The above interpretation is tantamount to saying that some compound nouns are psychologically motivated while others are not even though their environments are exactly the same as those in which fortition occurs. Therefore, the view that fortition is an attempt to enhance the distinctiveness of the second element seems to lose its persuasive power, when we consider non-fortition cases at the same time as fortition ones. This is plainly shown in the pairs of the following examples:

(18) a.	/t'añ-pət̬l/	[t'añp'ə̬d̬l]	`sallow'
	/t'añ-pəsəs/	[t'añbəsət̿]	`mushroom'
b.	/kyəñce-pəp/	[kyəñjep'əp]	`economic law'
	/kyəñce-pəm/	[kyəñjebəm]	`economic crime'
c.	/t'am-pañul/	[t'amp'añul]	`bead of sweat'
	/k̬m-pañul/	[k̬mbañul]	`gold ring'
d.	/p^{h}un-ton/	[p^{h}unt'on]	`petty cash'
	/kun-ton/	[kundon]	`wasted money'

As indicated by the above examples, it seems useless to try to search for an adequate reason to account for the fortition phenomenon which occurs in compound nouns. Kim-Renaud (1974:168) (1974:) claims that both

n-epenthesis and t-epenthesis are productive processes which apply even in the case of loanwords, presenting a few examples as evidence for their productivity:

(19)	/kok+p-iŋk^{h}+/	[kog+mniŋk^{h}+]	`high quality' + ink
	/pata-p+laus+/	[padap'uraus+]	`sea' + blouse
	/ratio-sok/	[radiot$^{=}$s'ok$^{=}$]	radio + `inside'

She further comments on this phenomenon, saying that "the applicability of t-epenthesis (...) is not easily predictable, determined not only by phonological but also by semantic-syntactic and lexical criteria..." (p.168).

We propose that the Post-obstruent Fortition is a process and the Post-sonorant Fortition is a rule to be acquired in the sense of Stampe(1972). There are many important reasons to believe that the latter is not a process but a rule. First, it lacks phonetic motivation. Second, although its application becomes habitual, the fortition is formed through speakers' conscious observation of linguistic differences. Third, there are many phonetic exceptions, but the alternation is quite regular for the morphological construction to which it applies. Fourth, it does not seem to apply to loanwords, which will be discussed below. Finally, the ordering of the fortition rule before the stop voicing process corresponds to Stampe's claim that acquired rules precede natural processes.

According to Donegan and Stampe (1979:144), processes apply to tongue-slips, Pig Latins, foreign words, etc. but "rules do not ordinarily apply in these cases." Let us examine whether or not the fortition rule applies to loanwords in the same environment as the native words of fortition cases. Observe the following examples:

(20)	/y nt^{h}an-kas+/	[y nt^{h}ank'as+]	`briquet' +gas
	/yakan-keim/	[yagank'eim]	`night' + game
	/t'aň-pol/	[t'aňp'ol]	`ground' + ball
	/samil-piltiň/	[samilp'ildiň]	`Samil' + building
	/satoň-tăm/	[andoňt'ăm]	`Andong'+ dam
	/il-talla/	[ilt'alla]	`one' + dollar

The above forms seem to illustrate the fortition phenomenon. If the data in (19) were the whole story, one might conclude that fortition applies to loanwords contrary to our claim. However, the lenis obstruents of some English words are borrowed as the Korean fortis counterparts through initial position strengthening, thus making such a conclusion incorrect.

In other words, the fortition phenomenon of the above examples is not due to the application of the fortition rule, but the result of the initial position strengthening, because the initial consonants of the isolated forms are also pronounced as fortis. The following are typical counter-examples to Kim-Renuad's claim that "t-Epenthesis (...) is productive, applying also to borrowed words"(p. 168):

(21)	/kol-ket^{h} /	[k'olget^{h}ə]	`goal getter'
	/k^{h}ol-kəl/	[k^{h}olgəl]	`call girl'
	/t^{h}ol-keit^{h}‡/	[t^{h}olgeit^{h}‡]	`toll gate'
	/taigiñ-pot‡/	[t'aibiñbod‡]	`diving board'
	/təm-pel/	[təmbel]	`dumbbell'
	/p^{h}enkwin-buk/	[p^{h}eñgwinbuk$^{=}$]	`Penguin book'
	/wetiñ-t‡les‡/	[wediñd‡res‡]	`wedding dress'
	/myucik^{h}al-t‡lama/	[myujik^{h}ald‡rama]	`musical drama'
	/in-t‡lop/	[ind‡rop$^{=}$]	`in-drop'

As shown above, the fortition rule is blocked in loanwords and the stop voicing process applies instead, even though the environment is fit for the fortition cases of native compound nouns. Since the former is entirely conventional or traditional, its application does not make utterances easier to say, but rather presents much articulatory difficulty to enhance distinctiveness. As pointed out by Donegan (1978;6), the application of the fortition rule does not vary according to variations of style or tempo which affect the phonetic difficulty of an utterance. Therefore, although Post-obstruent Fortition and Post-sonorant Fortition are similar-looking phenomena, they must be viewed and treated as unrelated and separate.

In conclusion, English loanword data suggest that the productivity of process is closely related to the nativization of loanwords, but that there are two kinds of processes to be blocked or triggered in adaptation of loanwords even though they are more or less productive in the native phonological component. The evidence from the fortition phenomena supports an assumption that Post-obstruent Fortition is a process while Post-sonorant Fortition is a rule in the sense of Stampe.

NOTES

*This paper represents a slight revision and reordering of topics presented in Chapter II and Chapter III of my 1984 Yeungnam University dissertation, entitled: A phonological study of English loanwords in

Korean.

[1]The term fortition is used in this paper in the limited sense of tensing lenis obstruents.

[2]The three types of Korean obstruents are referred to in the literature as (a) `forced,' `strong,' or `tense and unaspirated,' (b) `unaspirated,' `weak,' or `lax and slightly aspirated,' (c) `aspirated' or `tense and heavily aspirated.' In this paper, the first type will be referred to as the `fortis,' the second as the `lenis,' and the third as the `aspirated.'

[3]Throughout this paper // shows the underlying representation, and [] shows the surface representation. A hyphen is used for a morpheme boundary, S for a syllable boundary, and > for `derived from.' $C^{=}$ represents an unreleased stop, C' a fortis consonant, and C^{h} a strongly aspirated one. For typographical convenience, the following symbols have been adopted: [c] is used for the IPA symbol [tʃ], [j] for [dʒ], [š] for [ʃ], [r] for [ɾ], [ɨ] for [ɯ], [ə] for [ʌ], [a] for [ɑ], and [y] for [j].

[4]The underlying liquid /l/ is weakened to [r] both intervocalically and in intervening position between a vowel and a glide followed by another vowel:

l-Weakening

l ---> r / [+syl]__[-cons]

[5]For a number of examples like those in (7b), see C.-W. Kim (1970), Kim-Renaud (1974), and K. H. Lee (1982).

[6]Choi's (1971:1) study of foreign borrowings into Korean shows that borrowed words registered in the Say Hankul Sacen [New Korean Dictionary] (Hankulhakhoy 1968) consist of the following parts of speech and percentage:

Nouns	3,069	95.6%
Adverbs	59	1.8
Adjectives	53	1.7
Verbs	25	0.8
Interjections	3	0.1
total	3,209	100 %

[7]In Korean, one of two consonant clusters is deleted without exception before another consonant or a pause in the following way: If the second of the clusters is [+cor], the second is deleted; if the second is [-cor], the first is deleted.

CC-Simplification (Chung 1981:71)

```
                C
a.  C    [+cor] ---> C ø / ___ $
    1       2        1 2

                C                    C
b.  C    [-cor] ---> ø C / ____ [-cor] $
    1       2        1 2
```

[8]By `modifier' he means a noun which functions as a modifier to the following noun.

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SOME QUERIES CONCERNING THE SYNTAX OF MULTIPLE SUBJECT CONSTRUCTIONS IN KOREAN*

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In this paper, I examine two outstanding issues concerning the syntax of the so-called "multiple subject constructions" (MSCs) in Korean; namely, the issue of whether a subset of MSCs are to be derived syntactically from sentences containing a possessor NP through some syntactic means, and the issue of whether the first of the two (or more) NPs in an MSC is a "subject", in the sense of bearing the Grammatical Relation (GR) of a subject. In answer to these questions, I shall argue that MSCs cannot be derived from more canonical sentences and that the first NP does not bear the GR of a subject but instead acts as a sort of a ground-setting Focus for the sentential comment that follows it. I then suggest a way in which this property of MSCs in Korean can be naturally tied in with the often mentioned "Topic-promiment" property of Korean.

1. Introduction

The existence of the so-called "double" or "multiple" subject constructions (hereafter MSCs) in some languages, such as the sentence shown in (1), has been taken by various linguists as indicating a parameter along which languages may vary (e.g. Li and Thompson 1976; Huang 1984, 1985).

(1) Chulsoo-ka khi-ka kh‡ta
Chulsoo-NOM height-NOM great
`It is Chulsoo who is tall'

Li and Thompson (1976) suggested that the parameter sets apart "Topic prominent" (Tp) languages from "Subject prominent" (Sp) languages, with Chinese and English being representative of each class. They consider Korean and Japanese both subject and topic-prominent.

If they are correct in their speculation that what is involved is a parametric variation, we need to take a closer look at the relevant constructions in the Tp languages which represent the parameter. According to Li and Thompson, MSCs are examples par excellence of the ways in which Sp and Tp languages differ. Therefore, in this paper I will look into some aspects of the syntax of MSCs in one Tp language, Korean, within the framework of GB theory so as to understand the nature of parametric

variation, if any, that may be manifested in MSCs.

In this paper, I will attempt to provide answers to two recurring controversies surrounding MSCs in Korean within a GB framework. The first issue I address concerns the question of whether certain types of MSCs, represented by examples like (1) above, are to be derived syntactically from sentences like (2) illustrated below. The second issue concerns the subjecthood of the first NP in an MSC.

Regarding the first issue, there are some linguists who wish to derive a subset of MSCs in which the first NP stands in a possessor relation to the second NP (as in (1)) from more "canonical" sentences like (2) in which the first NP is contained as a Possessor of the second NP. Linguists who adhere to this view include Kuno (1973), Kang (1986), and Choe (1986), among others.

(2) Chulsoo-ɨy khi-ka kh̆ta
Chulsoo-GEN height-NOM great
`Chulsoo's height is great'(= is tall)

However, others (Yim (1985), Park (1980), Li and Thompson (1976)) posit no derivational relationship between (2) and (1). They argue that there is a difference in meaning between (1) and (2) and that there are MSCs like (3) for which no plausible derivation from a more basic source can be posited.

(3) Chulsoo-ka pal-i nelpta
Chulsoo-NOM foot-NOM is-wide
`It is Chulsoo who has wide contacts'

Pihaengki-ka 747-i kh̆ta
Airplanes-NOM 747-NOM big
`It is airplanes that the 747 is big'

The thrust of their argument is that since one needs to recognize (3) as basic (i.e., as base-generated), positing an additional mechanism to derive a subset of MSCs from other sources is unnecessary. However, this argument, which is based on certain assumptions related to the Occam's Razor, does not rule out the possibility of deriving some MSCs while base-generating others. The question as to whether there is a single source for MSCs or not cannot be decided on a priori grounds but is instead an empirical question that can only be answered within a given framework.

The first argument rests on certain assumptions about the relationship between syntax and semantics that are not clearly spelt out. Although Yim (1985) writes within a GB framework, he provides no syntactic arguments against the derivational view and simply claims that movement analyses are "generally rejected", a sweeping and mistaken overgeneralization given the number of recent proposals that utilize derivation.

Therefore, in this paper, I will look at the syntactic evidence concerning the plausibility of movement from a GB point of view and conclude on the basis of such evidence that movement is not feasible as an option in deriving some MSCs.

The second issue seems less a point of contention than the first but is no less important in understanding the nature of MSCs. It has to do with the "subjecthood" of the first NP in an MSC. Regarding this, there are some who claim directly or indirectly that the first NP is a subject. Kuno's Subjectivization proposal (1973) and Kang's recent adaptation of it to Korean (1985) make explicit claims about the subjecthood of the first NP. The Syntactic Adjunction approach of Choe (1986) in which adjunction is taken as creating multiple Grammatical Functions (GF) can be viewed as making a similar claim even though the GFs are not primitive entities in GB. In addition, any proposal that treats MSCs like (1) as involving Possessor Ascension (PA) ("NP/ECM" in GB terms), such as Kang (1987), also belong to this group since in PA, the ascended possessor assumes the GR previously borne by its host (in keeping with the Relational Succession Law).

As opposed to this, Shibatani (1977) proposed that the first NP has "nominative case" but does not bear the grammatical relation of a subject because aside from morphology, it shows no subject properties. Similar claims have been made in Lee (1987) and Kim (1987) within a GPSG framework.

The debate concerning the subjecthood of the first NP in an MSC, when translated into a GB framework, concerns primarily the A/A' status of the position it occupies at S-structure, however it may have gotten there (see (14) and (15) where the possibilities are illustrated).

My use of the term multiple subject constructions for expository purposes throughout this paper is not meant to imply that the first view is correct. In fact, I will provide evidence against the position that it is a subject (or bears the GF of subject) by arguing that the position it occupies cannot be an A position and by showing that it has none of the usual subject properties, contrary to what Kang (1986) and Kuno (1978) claim.

These two issues are logically separate (cf. (14) and (15)) but this fact seems to have gone unnoticed because the majority of those who view the first NP as a subject assumes a derivational analysis. But this is just one of the many logically possible alternatives. Therefore, I will deal with each issue separately.

2. Against Movement Analyses of MSCs

I will first address the issue of whether syntactic movement is a viable option in (1) from (2), independently of the subjecthood of the first NP. What I have to say principally concerns proposals where syntactic movement or adjunction is assumed to be involved in deriving (1), such as the proposals of Choe (1986) and Kang (1986) and Kang (1987). In GB theory, Subjacency (Chomsky 1981) and Chain Conditions (Chomsky 1986a) provide the diagnostics of movement, and when these are lacking, we suspect that what is involved is something other than movement, unless some other independently motivated explanation is available (e.g. parameterization of Bounding Nodes).

Therefore, it is incumbent on anyone proposing a movement analysis of

MSCs to show that the movement shows familiar properties of Move-alpha. If it doesn't, then one needs to provide principled explanations as to why it doesn't. Both Kang (1986) and Choe (1986) note that the Chain properties are not observed in MSCs and attempt to provide some explanations (or stipulations, in the case of the former) to account for this fact. However, even if one could somehow deal with this problem, movement analyses cannot be maintained because the putative movement involved in MSCs violates a fundamental diagnostic of movement rules, Subjacency.

2.1 Problems with Subjacency

The crucial kind of data which argues against movement analyses is provided below;

(4)a. Nampanku-ka munmyengkukka-ka namca-ka sumyeng-i ccalpta
Southern hemisphere-NOM civilized countries-NOM men-NOM life-span-NOM is-short
'It is the southern hemisphere that civilized countries are such that men are such that their life-span is short'

b. [[[[nampanku-ɨy] munmyengkukka-ɨy] namca-ɨy] sumyeung]-i ccalpta
Southern hemis-GEN civilized countries-GEN men-GEN life-span-NOM is-short

c. nampanku-ka [[[[[t]$_1$munmyengkukka-ɨy] namca-ɨy] sumyeng]-i ccalpta]]]]]

(4a) is an example of a truly "multiple" subject construction which the proponents of movement would derive from (4b), since the relationship between each adjacent pair of NPs is one of containment expressible in a possessive NP. But in order to derive (4a) from (4b) without violating Subjacency, the only possible order of derivation is to first derive (5a) from (4b).

(5a) [nampanku-ɨy munmyengkukka-ɨy namca]-ka [[t sumyeng]-i ccalpta]]

and then derive (5b) from (5a).

(5b) [nampanku-ɨy munmyengkukka]-ka [[t namca]-ka [[t sumyeng]-i ccalpta]]]

(4a) can now be derived from (5b). Crucially, if the movement is to be subjacent, what is predicted not to be possible is a sentence like (4c), since to derive (4c), one has to raise the most deeply embedded Specifier in severe violation of Subjacency. Now, since there is no conceptual limit to the number of NPs possible in an MSC, the number of intervening NP nodes could have been greater. Thus, the movement is potentially unbounded. The possibility of parameterizing bounding nodes or of positing an escape hatch is not available since the movement is unbounded and the extraction is from NPs where no independent escape hatches exist.

For Choe (1986), the problem with Subjacency did not arise since she considers sentences analogous to (4c) ungrammatical, in fact she considers

them so bad that she attributes their ill-formedness not only to Subjacency but to ECP as well, citing suggestions by R. Kayne that Subjacency violations are relatively mild when compared with ECP violations. Because of this, she maintains that syntactic adjunction - the mechanism responsible for deriving (1) from (2) in her framework - does not cross a barrier, i.e., it is subjacent.

But neither I nor do the majority of Koreans shares her intuitions. If sentences such as (4c) are acceptable, her theory faces serious problems since she will have to allow unbounded adjunctions. or she has to look for mechanisms other than adjunction in order to accomodate such data. However, it seems initially plausible to accomodate (4c) in a movement analysis without positing ad hoc "landing sites" in NPs to allow successive cyclic movement at least in the system of Chomsky (1986b), because Bounding Nodes (barriers) are not fixed once and for all but are relative to L-marking by theta-governing lexical heads and is sensitive to Agreement as well. In the following section, I will suggest a way in which one can keep adjunction and yet be able to account for (4)c.

2.2 L-marking in NPs and Subjacency

One of the novel attractions of Chomsky's Barriers(1986) is that bounding nodes (or barriers) are relativized to L-marking, so that an NP or S is not always a bounding node. Of the mechanisms responsible for L-marking, there is a device called Spec-Head Agreement (feature sharing) assumed to hold in IPs. What it does is make it possible for the Specifier of a subject NP in an ECM environment to be extracted even though INFL normally lacks the ability to L-mark subjects, because the IP itself is L-marked by the matrix verb and the subject NP L-marked as well by agreeing with the head I of the L-marked IP. Goodall (1986) proposed to extend Spec-Head Agreement to NPs in Chinese so that if an NP is L-marked, its Specifier will also be L-marked, for reasons analogous to the ones under consideration here.

If we adopt this idea together the the mechanisms for L-marking of subjects in Korean assumed in Choe (1986), it becomes possible for (4c) not to be a violation of Subjacency.

The idea works as follows. Suppose that Spec-Head Agreement holds in NPs (perhaps only in inalienable possession NPs if Choe (1986) is correct in saying that "extraction" is not possible in general from alienable NPs -- but see "Chulsoo-ka sunsaengnim-i coh+sita") and that L-marking in Korean works as follows:

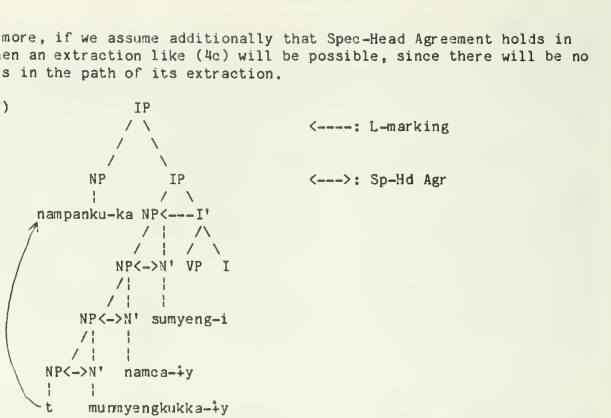
(6)(=Choe(1986)'s 25f)

L-marking for Korean:
a l-marks b iff a directly or indirectly assigns a theta-role to b.
(INFL indirectly assigns a theta role to the subject)

According to Choe (1986) then, all subjects in Korean will be L-marked regardless whether the clause itself is L-marked, unlike English.

Furthermore, if we assume additionally that Spec-Head Agreement holds in NPs, then an extraction like (4c) will be possible, since there will be no barriers in the path of its extraction.

(7)



This extension saves (4c) but unfortunately makes wrong predictions in other cases. Furthermore, there is a problem with Choe's proposal concerning L-marking. If subjects in Korean are always L-marked, one predicts that complements of head nouns of NPs in subject position should be extractable with no violation of Subjacency as in (8). And if the additional assumption about Spec-Head Agreement in NPs is correct, one predicts the extraction of complements of NPs embedded as the Specifier of another NP occurring as a subject as in (9). Neither of these predictions is borne out, however.

(8) a. [Chulsoo-ɨy [wangwi-ɨy kyesɨng]]-i uyeniessta
Chulsoo-GEN throne-GEN inheritance-NOM by-chance
Chulsoo's inheritance of the throne(complement) was by chance

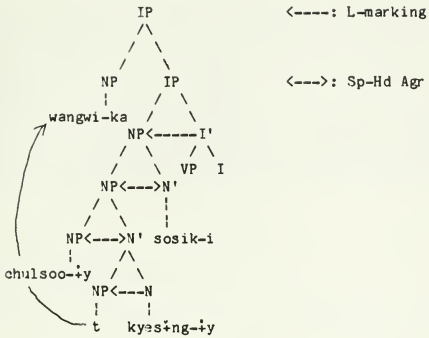
b. *Wangwi-ka [[Chulsoo-ɨy [t kyesɨng]]-i uyeniessta

An extraction like (9b) is predicted to be O.K. because subjects are L-marked and complements of nouns are by definition L-marked. So there is just one barrier crossed by adjunction to IP of the NP wangi and nothing goes wrong with the ECP. Yet the result is ungrammatical. Additionally, if Spec-Head holds in NPs, the derivation of (9b) from (9a) should be possible as well.

(9)a. [[Chulsoo-ɨy [wangwi-ɨy kyesɨng]]-ɨy sosik]-i tochakhaessta
Chulsoo-GEN throne-GEN inheritance-GEN news-NOM arrived

`The news of C's inheritance of the throne arrived'

b. *Wangwi-ka [[[Chulsoo-ɨy [t kyesɨng]]-ɨy sosik]-i
tochakhaessta



Since the highest NP is L-marked as a subject and its Specifier is L-marked by agreeing with the head which is L-marked, the extraction of the NP wangwi, should be O.K. but it is not.

One may argue that such an extraction is impossible because what is extracted is not a possessor. Indeed one may argue that what can be extracted has to be a particular kind of possessor, an inalienable possessor. Such arguments at best call for construction-specific constraints that are avoided whenever possible in GB. Besides it is not obvious that only inalienable possessors can be extracted anyway. If indeed only inalienable possessors can be extracted, then one has to account for the relationship between the head noun and the inalienable possessor which will allows it to be syntactically extracted while alienable possessors cannot be so extracted. The most plausible candidate is L-marking, so that Specifiers standing in a relation of "inalienable possesion" will be L-marked by the head whereas "alienable possessors" will not. But we have seen problems with suggesting that head Ns L-mark their possessors because L-marking voids barrierhood and allows the extraction of complements (which are L-marked regardless of whether the Specifier is an inalienable NP or not).

There are other ingenious ways to block an extraction like (9b). Hyon-Sook Choe (personal communication) suggests that L-marking by two different lexical heads may not void barrierhood, adopting in essence Baker's (1985) idea. The point is not the lack of conceivable explanations but rather the question of whether these added explanations provide any useful insight into the nature of MSCs. I contend that they do not, since there is evidence apart from considerations of Subjacency which lead us to believe that the attempt to employ movement to derive a subset of MSCs is on a wrong track altogether.

2.3 Evidence from Idioms

The interpretation of phrasal (sentential) idioms provides additional arguments against movement analyses of MSCs. Phrasal idioms are assumed to be inserted as a unit at DS, just as words are. This assumption helps explain the fact that a phrasal idiom acts as a unit in the syntax and that its internal phrasal structure is opaque to syntactic processes, as I have argued elsewhere (Yoon 1986). Thus, the fact that a sentence like (10) below can have both a literal and an idiomatic reading shows that a verbal like "be likely" triggers Raising rather than Equi (Soames and Perlmutter 1979) because the idiom would be a unit at DS under Raising but not under Equi.

(10) The cat is likely to be out of the bag.

(DS under Raising = [[e] likely [the cat be out of the bag]])

Now, in Korean we have phrasal idioms that are sentential.

(11)a. pal-i nelpta
foot-NOM is-wide

`has wide contacts, knows a lot of people'

b. son-i kh‡ta
hand-NOM is-big

`is very generous'

And such predicates can occur in MSCs like (12) below;

(12)a. [Chulsoo-ka [pal-i nelpta]]
`Chulsoo has wide contacts' (plus literal meaning)

b. [Chulsoo-ka [son-i kh‡ta]]
`Chulsoo is very generous' (plus literal meaning)

Since the relationship between the referent of the first NP and that of the second NP is one of inalienable possession, sentences in (12) would be derived from (13) according to the proponents of movement analyses.

(13)a. [Chulsoo-‡y pal]-i nelpta

b. [Chulsoo-‡y son]-i kh‡ta

But sentences in (13) lack the idiomatic reading and has only the literal reading. This is an anomaly in a movement analysis, given standard assumptions that idiomatic readings cannot be derived.

Under an approach where (12) is not derived from (13), the presence of the idiomatic reading in (12) as well as the lack of it in (13) is easy to explain. If (12) is a base-generated structure, the idiom pali-i nelpta is a unit at DS, while in (13), the putative DS for (12) under a movement

analysis, the NP pal-i and the AP nelpta do not form a constituent and therefore cannot be interpreted idiomatically.

2.4 Problems with Chain Properties

Another indication that something is wrong with the movement idea is that the Chain resulting from movement possesses typical properties of neither an A nor an A'-Chain. Since the decision as to whether what is involved is an A or A' Chain depends on one's stand on the subjecthood of the first NP, I will deal with this in the next section.

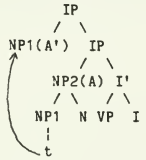
3. On the Subjecthood of the first NP:

3.1 Some Alternative Ways of Analyzing MSCs

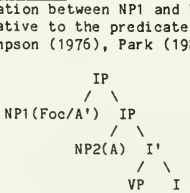
The issue of the subjecthood of the first NP in an MSC, when combined with the issue of whether movement is involved in MSCs, yields the following five possibilities, illustrated schematically in (14) and (15).

(14) First NP is not a subject (=no Possessor Ascension):

a. Movement/Adjunction (forms an A'-chain analogous to "Topicalization")

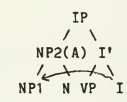


b. No Movement (NP2 is the base-generated subject; "Possessor" relation between NP1 and NP2 established by pragmatics; NP1 is A' relative to the predicate of IP and acts as "Focus") Li and Thompson (1976), Park (1980), Yim (1985)

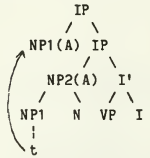


(15) First NP is a subject (= Possessor Ascension):

a. ECM (NP1 is in base-generated Spec position, Case and other "subject properties" attributed to ECM by INFL. Genitive Case in Spec either not assigned or optional, inducing ECM)

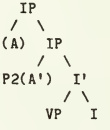


b. Movement/Adjunction (forms an A-chain (Choe (1986), Kang (1986))

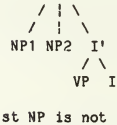


c. Non movement (NP1 is base-generated subject in A position; NP2 is an Adjunct. The relation of "possession" established by pragmatics)

i)



ii)



If the first NP is not a subject, depending on whether or not movement is involved, one can analyze MSCs either as in (14a) or in (14b). However, the difficulties with movement mentioned earlier preclude (14a) as an option and leaves us with (14b). (14a) deserves a little more discussion since it also has problems with respect to Chain Conditions. But I shall address this together with (15b).

If the first NP is a subject, one basically has three alternatives. The first alternative is ECM ((15a)). An analysis similar in spirit to this was proposed by Kang (1987) borrowing certain ideas in Choe (1986) and Massam (1985). Such an analysis would work as follows.

According to Choe (1986), subjects in Korean are always L-marked, so the Specifier of subject NPs can always be governed from outside. If one assumes with Massam (1985) that what makes NP/ECM possible is the non-uniqueness of Genitive Case or its optional assignment, the lack of Genitive Case within the subject NP will induce INFL to govern into the subject NP so that the Specifier of the subject will be able to get Case.

This proposal, although it has some merits (see below) that others do not have, is inadequate on at least two accounts. First of all, if the Specifier of the subject NP is only ECMed, one expects its D-structure constituency to remain unaffected. Howeer, there is evidence that the the "ECMed" Spec acts as a separate constituent from its head, whereas in the non-ECM counterpart it doesn't.

(16)a. *Younghee-ŧy ece apeci-ka tola-kasiessta
Y-GEN yesterday father-NOM pass-away

b. Younghee-ka ece apeci-ka tola-kasiessta
Y-NOM yesterday father-NOM pass-away

Also, there is the intuition that (15a) does not reflect the structure of predication involved in MSCs. In an MSC, the first NP acts as a "subject" upon which the rest of the structure (second NP plus its predicate) is predicated. If Predication requires mutual c-command, then in a configuration like (15a), the requirement is not met since NP1 does not c-command its "predicate" and the "predicate" is not even a constituent.[2]

However, (15a) makes an interesting prediction which may turn out to be correct. Since ECM is involved in (15a), one predicts that although NP1 can be a "subject" for the purpose of being governed and Case-marked by the INFL, it will not show "subject properties" that require c-command into the VP, since NP1 does not c-command anything in the VP. This translates into the prediction that it cannot be the antecedent of an anaphor in object position if antecedents have to c-command the anaphor. This may be a correct prediction if the 1st NP cannot be an antecedent under Core Binding (Yang 1985) that requires c-command but only under Peripheral Binding that is restricted by c-command.

(15c) is a possibility that no one has considered. As far as I can see, it is plausible. Under this analysis, the second NP would be analyzed on a par with adverbials and "floated quantifiers" that can optionally get "case-marked" (cf. (29) and (30) below). If (15c) is correct, one is claiming that the first NP is in an A position and has other subject properties besides morphological case-marking. However, as I shall argue below, such is not the case. Indeed, it is the second NP rather than the first that has all these properties.

I will consider (15b) in a little more detail since this is virtually the proposal made in Choe (1986), and more or less Kang (1986), although the latter has a slightly different orientation from the former. In my opinion, it faces quite serious problems. The first problem is one common to all movement analyses, violation of Subjacency. But I think there are

two additional problems concerning the Projection Principle (Chomsky 1981) and Chain Conditions respectively (Chomsky 1986a).

Under the view that phrase structure rules are to be eliminated in favor of projections of lexical properties (Stowell 1981, Travis 1984, Fukui and Speas 1986), A positions are those positions that are obligatorily selected by lexical heads whereas A'positions are those positions that are either optionally selected by lexical heads or those or those obligatorily selected by functional heads (COMP, DET, INFL). In this view, there can be no such a thing as a non-thematic A position (see Fukui and Speas 1986 for arguments) nor could there be a position which is "simultaneously" an A and an A' position (contra Massam 1985).

Thus, a predicate like tall in (1) which takes one obligatory argument (i.e, which is semantically intransitive) can project only one argument position. This position furthermore, by the Projection Principle, will remain throughout the syntactic derivation as the sole A position. Therefore, unless some means of making the original subject position an A' position is available, there is no other way in which the adjoined position can be an A position, since a one-place predicate can project only one A position, given that all other means of building phrases are eliminated. Therefore, the only way in which "tall" could project more than one A position is to become a transitive predicate, which it is not in (1).

Notice that this problem does not arise if the Chain is an A'-chain as in (14a). But (14a), and (15b) for that matter, even if problems with Subjacency and the Projection Principle could somehow be overcome, still raise some questions as to the nature of the Chain involved, as pointed out rightly by Choe (1986) and Kang (1986).

First of all, if the Chain is an A'-chain as in (14b), although the Projection Principle is not violated, the Chain lacks the typical properties of a normal A'-Chain. This is because A'-chains have both Case and Theta role determined at the tail of the Chain (Chomsky 1986a). But the A'-chain involved in (14b) has two distinct Cases on the head and the tail (Nominative and Genitive respectively).

Now one could try to explain this as Massam (1985) does by assuming that the A'/A-position that the NP moves to is a "subject" position, although it is only a predication subject. She assumes further that predication subjects may be required to be in a particular case. I do not find this a particularly convincing explanation lacking supporting evidence from other A' positions that are also presumably subjects of "predication". For instance, since semantically a sort of "predication" is involved in Topicalization structures (one is predicating something of the preposed phrase), why doesn't the topicalized indirect object in (17) below require a different case than Dative? If this is a parametric variation, what exactly is the content of the variation involved?

(17) To John, I will never sell this book.

In addition, this view of predication is substantially different from the original view espoused in Williams (1980, 1981) for whom subjects of predication by definition occur in A positions since they are defined as

external arguments of lexical heads. Massam (1985) claims that the notion of Predication she assumes is that of Rothstein (1983) where elements other than the "external argument" (Williams 1980), as long as the c-command requirement is met, can act as subjects of predication. Rothstein (1983) thinks this is necessary if one is to "reduce" the stipulative nature of the Extended Projection Principle (EPP) to the notion of Predication. I am not sure that anything is "reduced" by rewording the EPP as "predication" if now the latter has to be divorced from an empirically and intuitively verifiable notion of lexical argument structure and external arguments.

If one assumes that Genitive case assignment is optional, following Massam, or that the Genitive case-marker is incorporated, as in Choe (1986), then by the Chain location algorithm the Chain is an A chain and we get (15b).

The idea that genitive case can be withheld, leading to ECM by INFL is highly improbable for Korean in view of facts like (18) where INFL would have to govern the most deeply embedded Spec, in severe violation of the Minimality Condition (Chomsky 1986b).

(18) John-i apeci-ɨy chinku-ɨy tongryo-ɨy chinchek-i cukessta
J-NOM father-GEN friend-GEN colleague-GEN relative-NOM died

If incorporation is involved, it is invisible since there is no morphological indication either on the head noun or the verb that something has been incorporated. The idea of invisible incorporation (Stowell 1981, Baker 1985) to my mind makes incorporation totally empty of empirical content. For these reasons, and because of Subjacency violations, I find (15b) difficult to support as a plausible analysis.

This leaves us with (14b) and (15c), neither of which employs movement. In the next section, I will decide between (14b) and (15c) on the basis of the tests for the subjecthood of the first and the second NPs and conclude that (14b) has to be the correct way to represent MSCs since the arguments for the subjecthood of the first NP are not valid.

3.2 Tests for Subjecthood and their Consequences:

Defining the Grammatical Relation of subject in languages like Korean and Japanese is not easy since neither case-marking nor position serves to uniquely identify subjects as they do in some other languages. However, ever since the late 70's the tests for subjecthood proposed by Shibatani (1978) --- the antecedent of reflexives and subject honorification, have often been used indiscriminately as diagnostics for subjecthood in both Japanese and Korean. The tests have been employed in such a manner that anything that can be either the antecedent of reflexives or the target of honorification has been claimed to be a "subject". Such a line of reasoning would of course make perfect sense if reflexives could be bound only to subjects and nothing else and if honorification singles out subjects uniquely and no other categories.

However, with respect to the question of what can be the antecedent of reflexives, there is a general consensus that the subjects are not the only

categories that can serve as antecedents. Thus, showing that an NP in question can bind a reflexive may be necessary, but by no means sufficient evidence that the NP is a subject. In order to establish beyond doubt that an NP is a subject, one would have to show that the NP in question shows other subject properties in addition to the ability to antecede reflexives. Thus, just as clusters of properties are necessary to establish, say, a level of Logical Form (LF), clusters of properties related to subjects would have to converge on a single NP in order for it to be a "subject". It is for this reason that the Philippine languages pose a problem for the idea that "subjects" are universal, since in these languages the familiar "subject properties" are split between two or more nominals in a clause.

It may be that there is indeed a distinction between anaphors that are bound to subjects and those bound to non-subjects as some would like to claim (Yang 1985), reflected as either the difference between Core and Peripheral Binding or "logophoric" and pure anaphors. If this is the case, then Core Binding could be used as a diagnostic for subjecthood whereas Peripheral Binding cannot (see below).

With regard to subject honorification, I shall argue below that while the grammar of honorifics is seemingly sensitive to the GR of subject, it is possible to link the "subject honorific" to categories other than subjects in pragmatically biased contexts. That is, I shall argue that sometimes pragmatics salvages sentences that are strictly speaking ungrammatical. This is not really surprising in the case of honorification since honorification is a primarily pragmatic notion in the first place, a fact which leads some linguists to reason that there is no grammar of honorification per se but only honorific concord, subject only to whether or not the honorific can be felicitously attributed to the referent of an NP. I think that this latter view is too strong for Korean (and Japanese), since in pragmatically neutral contexts (see below), the honorific morpheme is linked to the subject, even when there is more than a single NP that qualifies pragmatically as potential antecedents (i.e, has a socially superior human referent).

Besides these two well-known subjecthood tests, Kuno (1978) has argued that the ability of an NP to be ECMed under certain matrix predicates, the ability to receive an "exhaustive listing" (=focus) interpretation, and the ability to occur in "adversity passives" are also indicative of the subjecthood of the NP that undergoes these processes. Regarding these, I shall argue that they do not constitute legitimate tests for subjecthood at all.

On the other hand, there do seem to be genuine tests for subjecthood that have not been utilized for reasons I do not fully understand. One such test is Equi constructions. Tests for subjecthood with Equi predicates that are otherwise known to be subject-control predicates (try, attempt, want, etc.) is one such test. Since in subject-control verbs the controller of Equi (PRO/pro subject of embedded infinitivals) is always a subject and nothing else, this is should be an unambiguous test. Also, coordination is sensitive to whether the gaps have the same grammatical functions. Therefore, coordinate subject deletions should also provide an unambiguous subjecthood test.

Summarizing, I have suggested that whereas there are indeed some independent tests for subjecthood, we should be cautious in claiming that something is a subject just because it can antecede reflexives or be linked to the honorific morpheme in interpretation. For the former, I suggested that by itself it cannot test for subjecthood at all if there is no distinction between Core and Peripheral binding. If there is such a distinction, only Core or anaphoric binding (as opposed to Peripheral or logophoric) suffices as a subjecthood test. For the latter, I suggested that we should watch out for the salvaging effect of pragmatics in some pragmatically biased contexts. With these provisos, let us examine each of the proposed test.

3.2.1 Honorification

Consider the sentences in (19) below;

(19)a. ?Kim-sacangnim-ɨy kohyang-i me-si-ta
Kim-boss-GEN hometown-NOM far-HON

b. ?Kim-sacangnim-i kohyang-i me-si-ta
Kim-boss-NOM hometown-NOM far-HON

c. Kim-sacannim-ɨy pise-ka cohɨ-si-ta
Kim-boss-GEN secretary-NOM good-HON

d. Kim-sacangnim-i pise-ka cohɨ-si-ta
Kim-boss-NOM secretary-NOM good-HON

Kuno (1978) took the possibility of attributing the honorific suffix in (19b) to the first NP to argue that it is a "subject", assuming that anything that can be linked with the honorific affix is a "subject".

However, I do not think this is sufficient evidence for us to conclude that the first NP is a "subject". As I mentioned above, the notion of honorification is primarily a pragmatic one, so that even when the grammar dictates otherwise, as long as a pragmatically felicitous inference can be made, it is possible for pragmatics to "salvage" ungrammaticality. The fact that the grammar of honorifics is strictly tied to the subject NP is shown clearly in (19d) where pragmatically, the boss is in a favored position to be respected, and yet, because the second (subject) NP has an animate referent, the honorific suffix unambiguously goes with the grammatical subject.

The situation described in (19b) is pragmatically odd. This is because the referent of the subject NP to which the honorific is linked is inanimate and showing respect is something one typically does to humans. Thus, grammatically speaking, (19b) is out. Nevertheless, when someone utters (19b), it is possible to make the pragmatic inference that the s/he intends to show respect to the boss and not to his hometown. Thus, while the grammar of honorifics rules (19b) out, we can nevertheless interpret the intention of someone who utterly it. (19b) is a case where pragmatics is salvaging ungrammatical sentences. If so, we expect to find (19b) odd and awkward, and indeed it is so.

For this reason, all of the native informants I have been able to check find (19b) awkward or impossible, though they concede that they can understand the intention of someone who utters it. Japanese speakers presented with analogous sentences also find them awkward, contra Kuno (1978) who does not indicate its awkwardness. The effect of pragmatics overriding ungrammaticality is shown more strikingly in (19a) which most people find awkward and yet they say they would use such a sentence in natural discourse. (19a) has a unique subject NP on anyone's account. No one would conclude on the basis of the fact that people can attribute -si- to the referent of the NP in Spec position that it is a subject. Analogously, the mere fact that the pragmatically felicitous reading of (19b) is one in which the honorific is linked to the first NP does not prove that it is a subject.

On the other hand, the second NP is not only unambiguously linked with the "subject honorific" morpheme in pragmatically neutral contexts like (19d), but is the trigger of other processes sensitive to subjects like coordinate subject deletion, controller of Equi in subject control verbs, as well as being crucially a lexically selected (external) argument of the predicate.

(20)

a. Kim-sacangnim-i pise-ka coh-si-ko pro pucirenha-si-ta
   Kim-boss-NOM Secretary-NOM good-HON(S)-and pro(S) diligent-HON(S)

b. Kim-sacangnim-i pise-ka [pro cip-e kalye-ko] haessta
   Kim-boss-NOM Secretary-NOM [pro(S) home-to go-COMP] tried

c. melta ("be far") lexically selects an NP that refers to a location

3.2.2 Reflexivization

Arguments based on the antecedent of reflexives to show that the first NP has subject properties assume that whatever is the antecedent of reflexives is a subject. But this is certainly not the case as evidenced in (21) below.

(21) (from Yang (1985))
[[tongsaeng-i caki-y ton-ul ta sseperi-n] Chulsoo]
brother-NOM self(C)-GEN money-ACC all spend-COMP Chulsoo

[Younghee-ka caki-lul miwehan-un kes]-i Chulsoo-lul slphke
Younghee-NOM self(C)-ACC hate fact-NOM Chulsoo-ACC sad

haessta
make

Alternatively, it is possible that there is a distinction between Core Binding where reflexives in Korean/Japanese obey the Subject Antecedent Condition, and Peripheral Binding where it does not hold, a distinction which may be similar to the distinction between anaphoric and logophoric pronouns. If there is no distinction between Core and Peripheral binding,

then one cannot use the ability to antecede reflexives as a subjecthood test at all.

Suppose there is a distinction. Then what is needed in order to prove that the first NP in an MSC is a subject is evidence that it falls under Core binding rather than Peripheral binding. (22) exemplifies Core binding where the reflexive is bound to c-commanding subjects. An important thing to note here is that when there is more than one c-commanding subject the reference of the reflexive is ambiguous, as shown in (22), that is, it can be bound to any c-commanding subject and not just to the closest one.

(22) John-i [Mary-ka [caki(J,M)-ka puca-la-n sasil]-ɨl molɨnɨn kes]-i
J-NOM M-NOM self-NOM rich-COMP fact-ACC unaware fact-NOM

isanghaessta
strange

`John thought it strange that Mary did not know that self (J,M) was rich'

Kang (1986) argues on the basis of sentences like (23) that the first NP is a subject since it can be the antecedent of reflexives.

(23) John-i caki-ɨy cip-ese aein-i casalhaessta
John-NOM self (J,lover)-GEN home-at lover-NOM commited-suicide

Before providing an explanation for (23), let us compare (23) with (24);

(24) John-i aein-i caki-ɨy cip-ese casalhaessta
John-NOM lover-NOM self (lover,*J)-GEN home-at commited-suicide

If both the first and second NP are subjects in (24), the reflexive should be bound under Core Binding, meaning crucially that it could be bound either to the first or the second NP, as was the case in (22). But it is not. Most informants find it impossible or extremely awkward to associate the reflexive with the first NP. (22) and (24) are identical in terms of the surface order and the command relations of possible antecedents of the anaphor and yet it is not possible for the reflexive in (24) to be bound ambiguously. This indicates strongly to the extent that the first NP in an MSC can bind a reflexive, it has to be under Peripheral rather than Core binding. (23) would then be an instance of Peripheral binding (see Yang 1985 for more examples), a claim which is substantiated by the "logophoric" interpretation of the pronoun.

Thus, being an antecedent of an anaphor in itself does not constitute evidence that the NP is a subject. Therefore, for the antecedent of anaphors to qualify as a subject, it needs to have independent subject properties. Such is not the case with the first NP in (23) as the following evidence from honorification (which we argued to sensitive strictly to subjects in pragmatically neutral contexts) coordinate subject deletion and subject controlled Equi shows.

(25)

a. John-i caki-ɨy cip-ese aein-i casalha-si-essta
J-NOM self-GEN house-at lover-NOM commited-suicide-HON (lover)

b. John-i caki-ɨy cip-ese aein-i yak-ɨl mek-ko pro casalhaessta
J-NOM self-GEN home-at lover-NOM pill-ACC take-COMP pro(1) commited-suicide

c. John-i caki-ɨy cip-ese aein-i [pro cukɨlye-ko] sitohaessta
J-NOM self-GEN home-at lover-NOM [pro(1) die-COMP] attempted

3.2.3 E.C.M

"Subject to Object Raising", or ECM is another of Kuno's subjecthood tests. Kuno (1978) observes that the first NP of an MSC can undergo "Raising" (ECM) as shown in (26) and uses this to argue that it is a subject.

(26) John-i [Mary-lɨl apeci-ka nɨlkessta-ko] saengkakhaessta
J-NOM [M-ACC father-NOM old-COMP] thought

`J considered Mary's father (to be) old'

This argument rests on the assumption that whatever can be "raised" is a subject. But I believe the assumption is unfounded. Consider sentences like (27).

(27) John-i [ece-lɨl nalssi-ka chuwessta-ko] saengkakhaessta
J-NOM [yesterday-ACC weather-NOM cold-COMP] thought

`J thought yesterday was cold'

I doubt anyone would consider the "raised" adverb in (27) to be a subject. Therefore, to prove that Mary-lɨl in (26) is a subject, one has to show that it shows other indisputable subject properties besides being able to be ECMed. But such properties are lacking, as shown in (28) below.

(28)

a. John-i Mary-lɨl apeci-ka nɨlkess-ko pro chuhata-ko saengkakhaessta
J-NOM [M-ACC father-NOM old-and pro(f) dirty-COMP] thought

b. John-i Mary-lɨl chinku-ka nɨlkɨ-si-essta-ko saengkakhanta
J-NOM [M-ACC friend-NOM old-HON(f)-COMP] thinks

3.2.4 Exhaustive Listing

Another argument put forth in support of the subjecthood of the first NP in an MSC comes from the fact that it can receive an "exhaustive listing" interpretation, whereas objects of transitive adjectives marked with nominative case cannot. This rests on the assumption whatever can receive "exhaustive listing" interpretation is a subject. Consider in this regard sentences like the following:

(29) a. Ece-puthe-ka nalssi-ka coa-ci-essta
Yesterday-from-nom weather-nom good-become

b. Nalssi-ka ece-puthe-ka coa-ci-essta

In both of the above sentences, no one would consider the PP "from yesterday" to be a subject, and yet in both versions, it preferentially receives the "exhaustive listing" interpretation, to the exclusion of the real subject "weather". It is hard to maintain, then, that "exhaustive listing" is something reserved exclusively for subjects. Similar evidence is available from "floated" quantifiers which are clearly not subjects and yet can receive "exhaustive" interpretation when affixed with the nominative particle.

(30) Haksaeng-i sul-ŧl nemyeng-i masyessta
Student-NOM beer-ACC four-counter-NOM drank

[Nemyeng-ŧy haksaeng]-i sul-ŧl masyessta
Four-GEN students-NOM beer-ACC drank

`Students, the four of them, drank beer'

3.2.5 Adversity Passives

Kuno's final argument has to do with adversative passives in Japanese, but since Korean lacks such a Passive, one cannot test for subjecthood on the basis of it. In order for Kuno's argument in Japanese to work, he would need to show that besides being able to be marked by -ni, the first NP of an MSC involved in an adversative passive shows other well established properties of subjects.

4. What about "Case Marking"?

The arguments put forth in sections 2 and 3 unanimously point to an analysis like (14b) as the most plausible analysis for MSCs in Korean and unambiguously answers the two questions raised at the outset of the paper -- movement cannot be involved in MSCs, and the first NP does not behave like a subject and so the position it occupies must be an A' position relative to the predicate of the sentence.

This raises questions about the prima facie evidence that leads people into thinking of sentences like (1) as containing two subjects -- the "nominative case" that is morphologically realized on the first NP. If the first NP is not a subject and does not occupy an A position, why does it nevertheless have "nominative case"? Or is it not nominative case but something else? I will not venture any definite answers answers at this point, but merely suggest some plausible ways one could pursue however we choose the answer the question.

First, if the -ka on the first NP is the realization of Abstract nominative Case assigned by the nominative Case assigner, then one needs to explain why in Korean a non-argument can or is required to have Case. This

would necessitate abandoning the Visibility requirement on Case theory so that non theta-marked categories can also be assigned "Case" in Korean --contra the Visibility Condition. There are various other possibilities that one could pursue to formalize this observation. This could involve possible parameterizations of the one-to-one restriction on Case, or the notion of the subject of Predication, so that arguments in A' positions can be subjects of predication or that they have to take a particular "case", as suggested by Massam (1985).

If -ka on the first NP is not a realization of Abstract Case, which I believe to be the case, then one plausible story for the "nominative case-marker" is that it really is some kind of a "discourse-particle" (or a delimiter) like nɨn, to, man, (called "special particles" in traditional grammar) whose distribution is not determined syntactically but pragmatically[3]. The advantage of this view is that it can keep the Visibility Condition as a requirement on Case theory. This is more than a supeficial gain because within GB, a category that is assigned Abstract Case corresponds more or less to "terms" in Relational Grammar. Thus the number of categories that can be assigned Abstract Case should be identical to the number of theta-marked arguments that a predicate has. This is exactly the correlation captured by the Visibility Condition. Therefore, saying that Case can be assigned to non-theta-marked categories is an implicit denial of this restriction, and of the Stratal Uniqueness Law and the Theta Criterion as well. By saying that the ka on the first NP is not a realization of Abstract Case, we can keep the apparently valuable generalization captured in the Visibility Condition.

Some indication that this may be on the right track comes from the Kuno's observation that the first NP can only have the "exhaustive listing" interpretation while real subjects are not restricted in this way. We could translate this to mean that it is marked by a discourse particle functioning as a "focus marker", just as it can be marked with other delimiters like the "topic marker".

Put together with the fact that the first NP does not play a role in the syntax of the clause that follows it (except by indirect pragmatic inference), this means that the MSCs are no different from English Topic-Comment structures like (31) where the "as for" phrase is clearly a separate constituent from the clausal comment that follows it and is licensed not by any property of the predicate of the clause but as an adverbial that is perhaps "Fully Interpreted" (Chomsky 1986a) by being "predicated of" the clausal comment at the relevant level of interpretation (LF or maybe LF').

(31) As for John, Mary is pretty

The only difference between the two languages would be that while English uses periphrastic constructions like as for, it...that to mark a constituent as Topic, Focus, etc., Korean uses a variety of affixal particles (nɨn, to, ka, man, etc.), in addition to periphrastic devices, to to indicate the pragmatic status of a nominal constituent vis-a-vis the ensuing clausal comment. This is hardly surprising given the agglutinative nature of the language and given the parallel existence of other types of

periphrastic (phrasal) and affixal (morphological), such as Causative Formation, in the language.

I am therefore tempted to analyze MSCs as a sort of "gapless focus construction", just as we have "gapless topic" and "gapless delimitative" constructions.

(32) Gapless (Nongap) Topic Construction

John-ɨn khi-ka khɨta
J-TOP height-NOM tall
`As for John, she is tall'

Gapless (Nongap) Delimitative Construction

John-man khi-ka khɨta
J-DEL height-NOM tall
`It is only John who is tall'

Gapless (Nongap) Focus Construction (alias "Multiple Subject")

John-i khi-ka khɨta
J-FOC height-NOM tall
`It is John who is tall'

What I am suggesting is that the first NP in an MSC may not be licensed by the predicate of the IP that follows it in the sense of being Case-marked or selected as an argument, but by principles that license "As for" phrases and other parentheticals in English, presumably as part of Full Interpretation at LF.

Partial support for reducing MSCs to "focus" constructions comes from Chinese where there are gapless "topic" constructions but not ones analogous to MSCs or gapless "delimitative" construction shown above. This can be explained as follows. Since Chinese lacks the morphological means to distinguish finely among focus, delimitation and topic (i.e., doesn't have particles that indicate these), the function of occurring in the leftmost position of the clause is identified with Topics, as is common in other languages.[4] Korean (and Japanese as well as Lisu for which there are analogous discourse particles) does not simply assign a Topic interpretation to the leftmost NP but interprets it according to the "discoursal status", so to speak, indicated by the discourse particles attached to it.

This possibility deserves further consideration, since this is not only consistent with the syntactic evidence we have gathered so far but jives well with other well-established properties of the language, such as its agglutinative nature and the parallel existence of other types of "gapless" constructions.

If this view turns out to be correct, the nature of "Topic prominence" that Li and Thompson believed was embodied in MSCs does not lie in some surprising property of the syntax of MSCs, because as far as its syntax is concerned there is nothing there is nothing surprising about the MSCs which

license a clause initial bare NP as an adverbial upon which the rest of the clause is "predicated".

Whatever else we may learn about MSCs, I think we now have limited but clear answers to the two questions raised at the outset concerning the syntax of MSCs. Therefore, we should pose additional questions from the vantage point of what we have learned.

NOTES

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[1]Kuno (personal communication) has indicated that (4c) may not be a violation of Subjacency if extraction takes place from a structure like (4b') given below.

(4b') [nampanku-ɨy [[[mumyengkukka-ɨy] namca-ɨy] sumyeng]-i ccalpta

But as he also pointed out, such an alternative structure is not available for the sentence given below.

Chulsoo-ka apeci-ɨy chinku-ɨy tonryo-ka tomangkassta
C-NOM father-GEN friend-GEN colleague-NOM ran-away

whose DS under movement can only be;

[[[[Chulsoo-ɨy] apeci-ɨy] chinku-ɨy] tonryo]-ka tomangkassta

Besides, Subjacency is not the only argument against movement analyses as I will show below.

[2]M.Y. Kang (1987), who essentially takes an ECM approach, overcomes this problem by having the head noun incorporate into the V at LF so that the head noun and the V(P) will be in the right configuration for Predication. This proposal is inadequate, however, since the evidence from adverb placement shows that the head noun and the ECMed Spec are already separate constituents at SS, if not at DS.

[3]This should be obvious since say, the leftmost position in a clause is NOT reserved for Topics in Korean but for a variety of NPs that are focused, topicalized, entailed, etc.

[4]This is not to say that Chinese does not have periphrastic (phrasal) means of indicating the varying discourse status of pre-clausal NPs but solely that a bare NP that precedes a clause is treated naturally as a Topics and not focus.

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